


STATE OF NEW HAMPSHIRE INTER-DEPARTMENT COMMUNICATION

DATE: September 21, 2018

FROM:  Matt Urban
Chief, Operations Mgmt. Section

AT (OFFICE): Department of Transportation

SUBJECT: Dredge & Fill Application
Lebanon NH – Hartford VT, 16148

Bureau of Environment

TO: Gino Infascelli, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith is the application package prepared by NH DOT Bureau of Bridge Design for the subject Major impact project. This project is classified as Major per Env-Wt 303.02 (p). The project is located on Interstate 89 in the City of Lebanon, NH and crossed over the Connecticut River into Hartford Vt. The proposed work consists of rehabilitation to the bridge. A more detailed project description has been included with the application.

This project was reviewed at the Natural Resource Agency Coordination Meeting most recently on August 15th 2018. Minutes from that meeting and others have been included with this application. A copy of this application and plans can be accessed on the Departments website via the following link: <http://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/wetland-applications.htm>

A mitigation narrative has been included within this application package. Mitigation will include a single and one time in-lieu fee payment into the ARM-Fund in the amount of \$53,746.56.

A payment voucher has been processed for this application (Voucher #542556) in the amount of \$10,000 (NHDOT Fee Cap).

The lead people to contact for this project are Robert Landry, Administrator, Bureau of Bridge Design (271-2731 or robert.landry@dot.nh.gov) or Matt Urban, Chief Operation Mgmt. Section, Bureau of Environment (271-3226 or matt.urban@dot.nh.gov).

If and when this application meets with the approval of the Bureau, please send the permit directly to Matt Urban, Chief Operations Mgmt. Section, Bureau of Environment.

MRU:mru
Enclosures
cc:
BOE Original
City of Lebanon (4 copies via certified mail)
David Trubey, NH Division of Historic Resources (Cultural Review Within)
Carol Henderson, NH Fish & Game (via electronic notification)
Maria Tur, US Fish & Wildlife (via electronic notification)
Mark Kern, US Environmental Protection Agency (via electronic notification)
Michael Hicks, US Army Corp of Engineers (via electronic notification)
Kevin Nyhan, BOE (via electronic notification)
Connecticut River Local Advisory Committee (via certified mail)
Mascoma River Local Advisory Committee (via certified mail)



Interstate 89 over the Connecticut River

Bridge No. 044/104 (N.B.)

Bridge No. 044/103 (S.B.)

NH Standard Dredge & Fill Application



**Lebanon, NH – Hartford, VT
A001(154)
16148**

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Lebanon, NH – Hartford, VT
A001(154), 16148

NH Dredge & Fill Permit Application
Bridge 044/104 & 044/103

NHDES Wetlands Permit Application Form



WETLANDS PERMIT APPLICATION

Water Division/ Wetlands Bureau Land Resources Management

Check the status of your application: www.des.nh.gov/onestop

RSA/Rule: [RSA 482-A/ Env-Wt 100-900](#)



Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

1. REVIEW TIME: Indicate your Review Time below. To determine review time, refer to [Guidance Document A](#) for instructions.

☒ Standard Review (Minimum, Minor or Major Impact)

☐ Expedited Review (Minimum Impact only)

2. MITIGATION REQUIREMENT:

If mitigation is required a Mitigation-Pre Application meeting must occur prior to submitting this Wetlands Permit Application. To determine if Mitigation is Required, please refer to the [Determine if Mitigation is Required Frequently Asked Question](#).

Mitigation Pre-Application Meeting Date: Month: 08 Day: 15 Year: 2018

☐ N/A - Mitigation is not required

3. PROJECT LOCATION:

Separate wetland permit applications must be submitted for each municipality that wetland impacts occur within.

ADDRESS: **Interstate 89**

TOWN/CITY: **Lebanon**

TAX MAP: **n/a**

BLOCK: **n/a**

LOT: **n/a**

UNIT: **n/a**

USGS TOPO MAP WATERBODY NAME: **Connecticut River**

☐ NA

STREAM WATERSHED SIZE: **4,286 sq mi**

☐ NA

LOCATION COORDINATES (If known): **43.634411, -72.328623**

☒ Latitude/Longitude ☐

4. PROJECT DESCRIPTION:

Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. **DO NOT** reply "See Attached" in the space provided below.

This project consists of the rehabilitation of the I-89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT. Work will entail the replacement of the existing superstructure steel with new steel and the in-fill of the gap between the bridges to provide a single 110'+/- wide bridge deck. The in-fill will require new footings between each of the five pairs of piers. See enclosed supplemental description for additional details.

5. SHORELINE FRONTAGE:

☐ NA This does not have shoreline frontage.

SHORELINE FRONTAGE: **600'**

Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

6. RELATED NHDES LAND RESOURCES MANAGEMENT PERMIT APPLICATIONS ASSOCIATED WITH THIS PROJECT:

Please indicate if any of the following permit applications are required and, if required, the status of the application.

To determine if other Land Resources Management Permits are required, refer to the [Land Resources Management Web Page](#).

Permit Type	Permit Required	File Number	Permit Application Status		
Alteration of Terrain Permit Per RSA 485-A:17	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED	<input type="checkbox"/> PENDING	<input type="checkbox"/> DENIED
Individual Sewerage Disposal per RSA 485-A:2	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED	<input type="checkbox"/> PENDING	<input type="checkbox"/> DENIED
Subdivision Approval Per RSA 485-A	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED	<input type="checkbox"/> PENDING	<input type="checkbox"/> DENIED
Shoreland Permit Per RSA 483-B	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED	<input type="checkbox"/> PENDING	<input type="checkbox"/> DENIED

7. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:

See the Instructions & Required Attachments document for instructions to complete a & b below.


a. Natural Heritage Bureau File ID: **NHB 18 - 2339**

b. ☒ [Designated River](#) the project is in ¼ miles of: **Connecticut River, Mascoma River**; and
date a copy of the application was sent to the [Local River Management Advisory Committee](#): Month: Day: Year:
☐ N/A

lrn@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

8. APPLICANT INFORMATION (Desired permit holder)			
LAST NAME, FIRST NAME, M.I.: Adams, Joseph			
TRUST / COMPANY NAME: NH Department of Transportation		MAILING ADDRESS: 7 Hazen Drive	
TOWN/CITY: Concord		STATE: NH	ZIP CODE: 03302
EMAIL or FAX: joseph.adams@dot.nh.gov		PHONE: 271-2731	
ELECTRONIC COMMUNICATION: By initialing here: <u>SA</u> , I hereby authorize NHDES to communicate all matters relative to this application electronically.			
9. PROPERTY OWNER INFORMATION (If different than applicant)			
LAST NAME, FIRST NAME, M.I.: NH Department of Transportation			
TRUST / COMPANY NAME:		MAILING ADDRESS: 7 Hazen Drive	
TOWN/CITY: Concord		STATE: NH	ZIP CODE: 03302
EMAIL or FAX: matt.urban@dot.nh.gov		PHONE: 271-3226	
ELECTRONIC COMMUNICATION: By initialing here <u>mru</u> , I hereby authorize NHDES to communicate all matters relative to this application electronically.			
10. AUTHORIZED AGENT INFORMATION			
LAST NAME, FIRST NAME, M.I.: Perron, Christine		COMPANY NAME: McFarland Johnson	
MAILING ADDRESS: 53 Regional Drive			
TOWN/CITY: Concord		STATE: NH	ZIP CODE: 03301
EMAIL or FAX: cperron@mjinc.com		PHONE: 225-2978	
ELECTRONIC COMMUNICATION: By initialing here <u>cip</u> , I hereby authorize NHDES to communicate all matters relative to this application electronically.			
11. PROPERTY OWNER SIGNATURE:			
See the Instructions & Required Attachments document for clarification of the below statements			
By signing the application, I am certifying that:			
<ol style="list-style-type: none"> I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining. The mailing addresses I have provided are up to date and appropriate for receipt of NHDES correspondence. NHDES will not forward returned mail. 			
 Property Owner Signature		Joseph C. Adams Print name legibly	9/17/2018 Date

MUNICIPAL SIGNATURES

12. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.

	Print name legibly	Date
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DIRECTIONS FOR CONSERVATION COMMISSION

1. **Expedited review ONLY** requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will be reviewed in the standard review time frame.

13. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

	Print name legibly	Town/City	Date
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DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3, I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. **IMMEDIATELY** sign the original application form and four copies in the signature space provided above;
3. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
4. **IMMEDIATELY** distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, original permit application form bearing the signature of the Town/ City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery.

14. IMPACT AREA:

For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact

Permanent: impacts that will remain after the project is complete.

Temporary: impacts not intended to remain (and will be restored to pre-construction conditions) after the project is complete.

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.	TEMPORARY Sq. Ft. / Lin. Ft.
Forested wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Scrub-shrub wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Emergent wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Wet meadow	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Intermittent stream	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Perennial Stream / River	24,013 / 444 <input type="checkbox"/> ATF	93,999 / 434 <input type="checkbox"/> ATF
Lake / Pond	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Bank - Intermittent stream	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Bank - Perennial stream / River	623 / 59 <input type="checkbox"/> ATF	1,148 / 131 <input type="checkbox"/> ATF
Bank - Lake / Pond	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Tidal water	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Salt marsh	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Sand dune	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Prime wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Prime wetland buffer	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Undeveloped Tidal Buffer Zone (TBZ)	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Previously-developed upland in TBZ	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - Lake / Pond	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - River	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - Tidal Water	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Vernal Pool	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
TOTAL	24,636 / 503	95,147 / 565

15. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

☐ Minimum Impact Fee: Flat fee of \$ 200

☒ Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking) 119,783 sq. ft. X \$0.20 = \$ 23,956.60

Temporary (seasonal) docking structure: sq. ft. X \$1.00 = \$

Permanent docking structure: sq. ft. X \$2.00 = \$

Projects proposing shoreline structures (including docks) add \$200 = \$

Total = \$

The Application Fee is the above calculated Total or \$200, whichever is greater = \$ 10,000

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Supplemental Project Description

Lebanon, NH - Hartford, VT, 16148

Supplemental Project Description

Existing Conditions

The project area straddles the Vermont-New Hampshire state line between the towns of Hartford, VT and Lebanon, NH where I-89 crosses the Connecticut River. The state line was determined in a 1934 U.S. Supreme Court decision to be the low water line on the Vermont side, as it occurred at that time. Most of the river, therefore, is in New Hampshire. The I-89 bridges span the Connecticut River and the New England Central Railroad (NECRR) in Vermont.

On the Vermont side of the river crossing, commercial development along the I-91 interchange and the village of White River Junction are found to the north, with single family homes and the New England Central Railroad running along the river. The New Hampshire side also contains commercial development along the Exit 20 interchange, the Lebanon Municipal Airport, and the village of West Lebanon to the north.

The Connecticut River has a width of approximately 550 feet in the project area, and is a 7th order river with a watershed that extends north into Canada. The Cowardin classification for the river at the project location is R2UBH, or riverine, lower perennial, with an unconsolidated bottom, permanently flooded. Under the bridge on the Vermont side, the riverbank is armored with stone from the rail line down to a low floodplain that parallels the river. Vegetation includes hemlock (*Tsuga canadensis*), poplar (*Populus* sp.), white birch (*Betula papyrifera*), elm (*Ulmus* sp.), and box elder (*Acer negundo*). The low floodplain supports green ash (*Fraxinus pennsylvanica*), elm (*Ulmus* sp.), and honeysuckle (*Lonicera* sp.). The land on the New Hampshire side of the river is generally lower and supports tree species including white pine (*Pinus strobus*), sycamore (*Platanus occidentalis*), and elm along with invasive species such as knotweed (*Fallopia japonica*), honeysuckle, and barberry (*Berberis thunbergii*). The riverbanks on both sides show evidence of historical and recent disturbance.

The northbound (NB) and southbound (SB) barrels of I-89 each consist of two travel lanes, with direction of travel carried by separate but identical bridge structures. Bridge No. 044/103 carries I-89 SB traffic and Bridge No. 044/104 carries I-89 NB traffic. The six-span, 840-foot bridges were constructed in 1966 and consist of non-composite, haunched steel plate girders founded on cantilever abutments and hammerhead piers. Each bridge has five piers. Four of the piers are located in the river in NH and the fifth pier is located adjacent to the rail line in VT. The bridges are inspected and maintained by the NHDOT through an agreement with the Vermont Agency of Transportation (VTrans).

Project Description

The purpose of this project is to improve safety by addressing geometric deficiencies and to preserve the structural integrity of the existing I-89 northbound and southbound bridges while maintaining this vital, high-volume transportation link between New Hampshire and Vermont.

The need for this project is as follows:

- The southbound bridge is currently on the State of NH Department of Transportation's Red List and is considered structurally deficient based on its deteriorated superstructure.
- The northbound bridge is currently on the State of NH Department of Transportation's Red List and is considered structurally deficient based on its deteriorated deck.
- The existing inside and outside shoulder widths on both bridges are non-standard at only

Lebanon, NH - Hartford, VT, 16148
Supplemental Project Description

3'-0" wide, and wider shoulders are preferable.

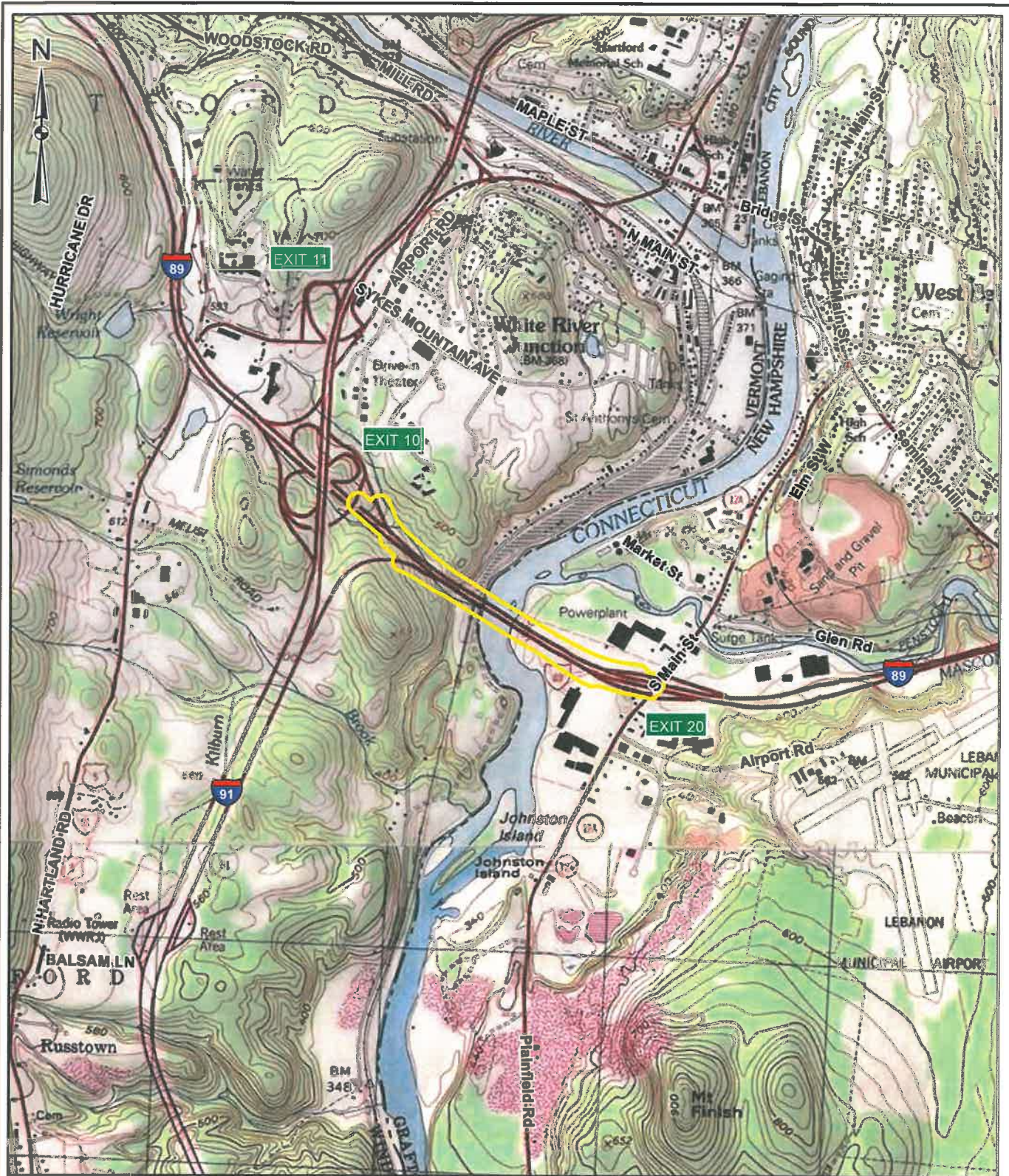
- The on-ramp from northbound Interstate 91 to southbound Interstate 89 has an insufficient merge distance and there is less than the desirable 2,000 feet between the southbound on-ramp from I-91 northbound and the off-ramp to Exit 20. There are crashes occurring on the southbound on-ramp from I-91 as a result of these geometric deficiencies.

The proposed project will consist of a bridge in-fill that will close the gap between the two existing bridges. New piers will be required that will be constructed between the existing piers. A new superstructure will entirely replace the existing decks, structural steel, and bearings. The bridges and approaches will carry a total of six lanes of traffic, two through lanes in each direction and auxiliary lanes between Exit 20 in New Hampshire and the Interstate 91 Interchange in Vermont. Traffic control for the project will consist of a phased construction process utilizing temporary median crossovers.

Two piers require scour protection. The first, easternmost pier does not experience scour and the fourth, westernmost pier in the river is located on bedrock; therefore, these two piers do not need scour protection. A-Jacks concrete armor units are proposed for the two piers in the center of the river. Mats of these interlocking units would be constructed on land or a barge and then lowered by crane to the river bottom around each pier. The mats would be placed on top of the channel substrate. The existing piers have been experiencing scour, and scour protection would be necessary even if new footings were not proposed for the in-fill.

A temporary work trestle across the full width of the Connecticut River will be constructed on either the upstream or downstream side of the bridge. Fingers off the main trestle would be needed to access each pier. A temporary causeway/bulkhead would be needed off each bank of the river to provide a platform from which the trestle would be constructed. A small work platform may also be needed under the bridge between the NH bank and first pier. The trestle and bulkheads would be in place for the duration of construction, which is expected to be up to four years. It is anticipated that the total area of temporary impact from the temporary trestle piles would be approximately 600 square feet, all of which would be in NH. The bulkheads would be needed on one side of the bridges only; however, they are shown on both sides to provide flexibility to the Contractor on selecting the location of the causeway. The Contractor will also be given the option to access the VT pier from the VT side of the river; however, this option will require a temporary railroad crossing, which could become costly due to flagger and insurance requirements. If the Contractor chooses this option, a portion of the trestle would not be needed.

Location Maps



 Approximate Project Area

NH DOT
Lebanon-Hartford, NH-VT

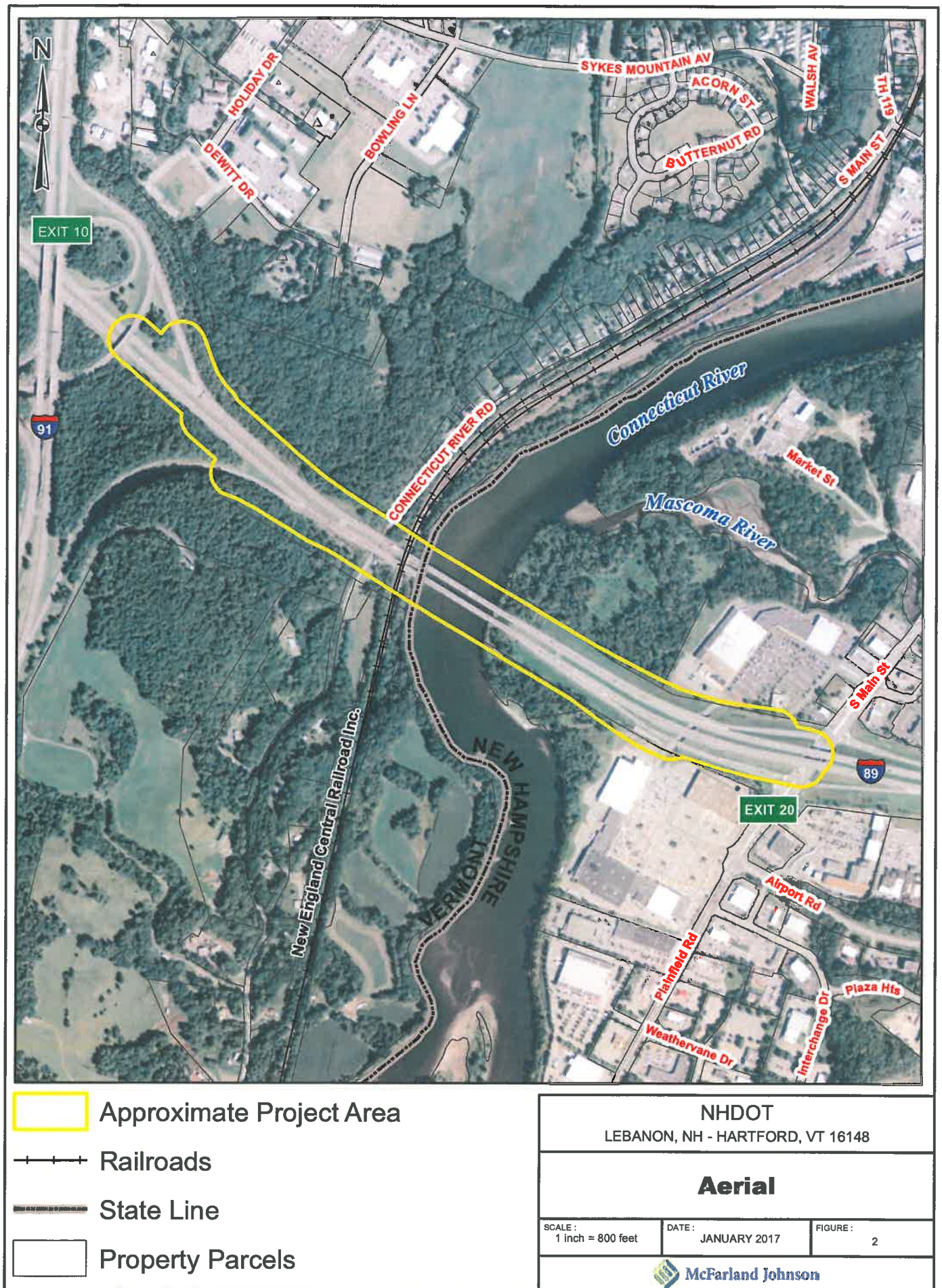
Project Location Map

SCALE:
1 inch = 2,000 feet

DATE:
JANUARY 2017

FIGURE:
1

 **McFarland Johnson**



Attachment A – 20 Questions



WETLANDS PERMIT APPLICATION – ATTACHMENT A MINOR AND MAJOR - 20 QUESTIONS

Land Resources Management
Wetlands Bureau

Check the Status of your application: www.des.nh.gov/onestop



RSA/ Rule: RSA 482-A, Env-Wt 100-900

Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

The purpose of this project is to improve safety by addressing geometric deficiencies and to preserve the structural integrity of the existing I-89 northbound and southbound bridges while maintaining this vital, high-volume transportation link between New Hampshire and Vermont.

The need for this project is as follows:

- The southbound bridge is currently on the State's Red List and is considered structurally deficient based on its deteriorated superstructure.
- The northbound bridge is currently on the State's Red List and is considered structurally deficient based on its deteriorated deck.
- The existing inside and outside shoulder widths on both bridges are non-standard at only 3'-0" wide.
- The on-ramp from northbound Interstate 91 to southbound Interstate 89 has an insufficient merge distance and there is less than the desirable 2,000 feet between the southbound on-ramp from I-91 northbound and the off-ramp to Exit 20. There are crashes occurring on the southbound on-ramp from I-91 as a result of these geometric deficiencies.

2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.

The proposed project will consist of a bridge in-fill that will close the gap between the two existing bridges. New piers will be required that will be constructed between the existing piers. Scour protection will be placed around two of the four piers located in the river.

Rehabilitation without widening was considered. However, this alternative would not address the sub-standard bridge width and insufficient merge distance, both of which are safety concerns on this high-volume interstate. Widening the bridges to the outside was considered. However, this would result in greater impact to the river and to resources adjacent to the bridge approaches.

To determine if widening the bridges could be accomplished without permanent river impacts, connecting the existing piers with extended pier caps to support the new in-filled superstructure was considered. This option would use top-down construction and eliminate the need for new piles and scour protection in the river. However, it was determined that the piles and upper portion of the pier stem would be significantly overstressed due to the induced frame action inherent with this option. Therefore, this alternative was not selected.

Scour protection is needed around two of the existing piers located in the river in order to prevent continued scour that could compromise the piers. The footprint of scour protection has been minimized to the extent possible. Scour protection had been proposed around a third pier but it was later determined that it was not needed since the substrate and footing were stable at this location. The fourth pier in the river is founded on bedrock and therefore does not require scour protection.

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3. The type and classification of the wetlands involved.

R2UBH - Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded (Connecticut River)

Bank

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

The river has a width of approximately 550 feet in the project area, and is a 7th order river with a watershed that extends north into Canada. The river lies primarily in New Hampshire, and the state line is at the low water line on the Vermont side, as decided by the U.S. Supreme Court in 1933.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

There are no rare wetland types, prime wetlands, or exemplary natural communities in the project area. The Connecticut River is a 407-mile river and has no unique characteristics within the project area.

6. The surface area of the wetlands that will be impacted.

Permanent impacts are as follows:

Bank: 623 sq ft from regrading for the proposed treatment swale (impact location A) and outletting a pipe from the infiltration basin (impact location N)

Channel: 24,012 sq ft from construction of new pier footings (impact locations D,F,H,I) and scour protection (impact locations E,G)

Temporary impacts are as follows:

Channel and bank: 95,147 sq ft to allow for construction of temporary causeways (impact locations B,C,K,L,M,O,J,Q) and a temporary trestle for construction access (impact location P). Impact location P includes adequate area to allow the Contractor to choose the location of the trestle (either upstream or downstream). Actual impacts to the channel would be limited to the trestle piles, which would be approximately 600 sq ft. within impact area P.

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7. The impact on plants, fish and wildlife including, but not limited to:

- a. Rare, special concern species;
- b. State and federally listed threatened and endangered species;
- c. Species at the extremities of their ranges;
- d. Migratory fish and wildlife;
- e. Exemplary natural communities identified by the DRED-NHB; and
- f. Vernal pools.

The NH Natural Heritage Bureau has records of State and Federally listed species in the vicinity of the project: cobblestone tiger beetle, dwarf wedgemussel, mudflat spikesedge, and bald eagle. Also, plant species listed in Vermont occur downstream of the project. The VT Natural Heritage Inventory had no concerns with these species. NH Fish & Game was contacted about the project and had no concerns with the tiger beetle or bald eagle. The USFWS was contacted and had no concerns with dwarf wedgemussels since the nearest population occurs more than a mile downstream. A survey for the spikesedge was completed in October 2015. This plant was not found in the project area. The NHB has no further concerns with this species. Documentation of coordination with these agencies is included elsewhere in this application package.

The USFWS Information, Planning, and Conservation System (IPaC) web tool was utilized to determine if federally listed species have the potential to occur in the project area. According to IPaC, the federally-threatened northern long-eared bat is a potential concern in this region. Time of year restrictions will be implemented for tree clearing to avoid potential impacts to this and other bat species. No evidence of bats using the bridge to roost has been observed to date. A finding of May Effect, Not Likely to Adversely Effect has been made for this project.

The project as proposed will not obstruct aquatic organism passage during construction or following completion of construction. Large portions of the channel will remain accessible throughout construction. Wildlife passage can currently take place along the NH bank where an access trail travels under the bridge. This trail will remain following construction.

No vernal pools were identified in the project area.

8. The impact of the proposed project on public commerce, navigation and recreation.

The Connecticut River is used for recreational boating and fishing, and typical boats in the river range from canoes and kayaks to bass boats. During construction, a work trestle will be installed across the full width of the river. Construction activities will limit access to certain areas along the banks and within the channel for the duration of construction. However, boats will continue to be able to use the river through the project area during construction. Based on the typical types of boats that would likely be found on this section of the river, between six to eight feet of clearance is needed to pass under a structure. The elevation of ordinary high water in the project area is 331' and the 10-year event is 342'. There will be a stipulation in the contract that the Contractor must construct at least one section of the temporary trestle above the elevation of the 10-year event. This will provide adequate clearance for boaters during most flow conditions.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

The project is addressing existing interstate infrastructure and will not result in substantial changes to the aesthetics of the surrounding area.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

All work will be located in existing right-of-way. Traffic on the Interstate will be maintained throughout construction and recreational boats will be able to utilize the river during construction. Access to the river bank for fishing will be restricted in the vicinity of the bridge during certain phases of construction. Following construction, all existing access will be restored.

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

Due to the proposed in-fill between the existing piers and the proposed scour protection around 2 piers, the work will result in an increase in base flood elevation of 0.04 feet (0.5"). To mitigate for this impact, the VT river bank will be benched to create a narrow shelf approximately one foot above ordinary high water. The bench will be created along 388 linear feet of bank and will be approximately 20' in width. The bench will be tapered at each end to avoid abrupt changes that could lead to scour.

The proposed bench will eliminate the increase in base flood elevation. This concept was reviewed for geotechnical and constructability concerns. It was concluded that the bank cut would not negatively impact the bridge pier. The 10-foot clayey-silt layer is stiff, has low compressibility, and is non-plastic. Within the areas of the pier foundation, the pier piles act as reinforcing of the slope between the river and the railroad and no impacts to the railroad are anticipated. The project is not expected to result in impacts to abutters upstream or downstream.

12. The benefit of a project to the health, safety, and well being of the general public.

The project will provide safety benefits to the traveling public by improving traffic operations and maintaining the integrity of the bridges.

13. The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

This segment of the river is listed on the NHDES 2014 303(d) List for E. coli contamination from combined sewer overflows. VT's 2012 List of Priority Surface Waters identifies this portion of the river as impaired for aquatic life support by flow alteration caused by fluctuating flows associated with the Wilder Dam. The project will not change the conditions responsible for these impairments.

Stormwater runoff from most of the proposed new pavement and areas of existing pavement will be treated by permanent stormwater BMPs. Work as proposed will result in a net increase in impervious surface of approx 0.5 ac in VT. An infiltration basin proposed in VT will collect and treat runoff from approx 2.04 acres of pavement. On the NH side, there will be an increase of approx 0.9 ac of impervious surface. The proposed treatment swale and infiltration basin will treat runoff from approx 2.82 ac of pavement. For the overall project, there would be 4.86 ac of pavement treated, compared with an increase of 1.4 ac of impervious. Treating more impervious surface than will be added on the bridge approaches will offset the additional impervious deck area over the river that will discharge directly into the river through scuppers in the bridge deck. For this reason, the project is not expected to impact overall water quality in the project area.

All appropriate erosion and sedimentation control measures will be utilized to avoid adverse impacts to water quality during construction.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

As described in #11 above, mitigation will be incorporated into the project so that the project will not change the base flood elevation. Therefore, the project will not cause or increase flooding.

All disturbed surfaces will be stabilized during construction and all appropriate erosion and sedimentation control measures will be utilized to avoid adverse impacts to water quality during construction.

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

The proposed project will not redirect river currents. The proposed bank bench along the VT bank will be located above Ordinary High Water and will be flooded only during larger flow events. The bench will be tapered at each end to avoid abrupt changes that could lead to scour. The new piers and footings will be between the existing piers and footings and will be identical in shape and size. This configuration will minimize any effect on river currents and water velocities.

16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.

All future proposed impacts to the river would need to comply with applicable state and federal regulations.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

The project will not impact the functions and values of the Connecticut River. The project will not result in changes to any significant statewide or local natural, managed, cultural, or recreational resources within the river corridor. Impacts to the river itself will largely be temporary in nature and will be limited to the area within the immediate vicinity of existing infrastructure.

lm@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

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18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

There are no nationally listed Natural Landmarks in Lebanon, NH or Hartford, VT.

19. The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

The Connecticut River is not a nationally designated river or wilderness area.

20. The degree to which a project redirects water from one watershed to another.

The project will not redirect water from one watershed to another.

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Additional comments

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Natural Resource Agency Coordination Meeting Minutes

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Concord, NH 03313



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MEETING NOTES

PROJECT: LEBANON, NH – HARTFORD, VT 16148 **DATE OF MEETING:** August 15, 2018
(MJ Project No: 17732.01)

LOCATION: NHDOT – Bureau of Environment

SUBJECT: NHDOT Natural Resource Agency Coordination Meeting – DRAFT minutes

PROJECT REPRESENTATIVES:

NHDOT: Samantha Fifield, Marc Laurin

MJ: Brian Colburn, Christine Perron

NOTES ON MEETING:

This project involves the rehabilitation and widening of the Interstate 89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT. The project was last reviewed at this meeting in February 2017. **The purpose of today's meeting is to review proposed impacts and mitigation once more before permit applications are submitted.**

Brian Colburn provided an overview of the project. The existing superstructure steel will be replaced with new steel and an in-fill will be constructed in the gap between the bridges to provide **a single 110'+/- wide bridge deck** to facilitate traffic control. The in-fill will require new footings between each of the five pairs of existing piers, four of which are located in the river. The resulting bridge will allow for maintenance of traffic during phased construction. Following construction, the bridge will provide two through lanes in each direction and auxiliary lanes between Exit 20 and I-91 ramps.

Three stormwater treatment areas will be constructed to treat runoff. Work as proposed will result in a net increase of approximately 0.9 acres of impervious surface in New Hampshire and 0.5 acres in Vermont. A proposed treatment swale and infiltration basin in New Hampshire will treat runoff from approximately 2.82 acres of pavement. An infiltration basin proposed in Vermont will collect and treat runoff from approximately 2.04 acres of pavement. For the overall project, there would be approximately 4.86 acres of pavement treated, compared with an increase of 1.4 acres of new impervious surface.

Two piers require scour protection. The first, easternmost pier does not experience scour and the fourth, westernmost pier in the river is located on bedrock; therefore, these two piers do not need scour protection. A-Jacks concrete armor units are proposed for the two piers in the center of the river. Mats of these interlocking units would be constructed on land or a barge and then lowered by crane to the river bottom around each pier. The mats would be placed on top of the channel substrate. Since no excavation or placement of bedding materials will be required for the A-Jacks, the use of cofferdams will be limited to the

footprint of the new pier footings. The existing piers have been experiencing scour, and scour protection would be necessary even if new footings were not proposed.

Due to the new piers and scour protection, the work as proposed would result in a slight increase in base flood elevation. Mitigation will be incorporated into the project to eliminate this increase. Proposed mitigation will entail benching into the VT bank to create a narrow shelf, staying approximately 1' above ordinary high water.

A work trestle across the full width of the Connecticut River will likely be needed for construction. To provide flexibility to the Contractor in locating the temporary construction trestle, a large footprint of temporary impact will be included in the permit application to accommodate an upstream or downstream trestle with extensions to the middle of the bridge to access each pier. This large footprint eliminates the need to show the location of every trestle pile. Actual temporary impacts within this large footprint would be limited to the trestle piles, which would total approximately 600 sq ft.

A temporary causeway/work platform would be needed off each bank of the river to provide a platform from which the trestle would be constructed. A small work platform will also be needed under the bridge between the NH bank and first pier. The trestle and causeways would be in place for the duration of construction, which is expected to be up to four years. The Contractor will only be allowed to build one trestle, either upstream or downstream of the bridge, so only 3 of the 5 causeways would be constructed (one for pier access, two for the trestle).

Christine Perron provided a summary of proposed impacts:

Permanent wetland impacts: There will be no wetland impacts in NH.

Permanent bank impacts from drainage work: 623 sq ft (59 linear ft)

Permanent channel impacts from the new footings: 3,117 sq ft (158 linear feet)

Permanent channel impacts from scour protection: 20,895 sq ft (286 linear feet)

Temporary impacts from causeways: 6,710 sq ft (213 linear feet)

Temporary impacts from trestle/construction footprint: 87,289 sq ft (Actual impacts from the trestle would be limited to the piles that support the trestle, which would be a total of approximately 600 sq ft.)

Total permanent: 24,635 sq ft (503 linear feet)

Total temporary: 95,147 sq ft (565 linear feet)

Temporary impacts to Vermont side of the river: 385 sq ft

C. Perron noted that she had coordinated with Mike Hicks and his counterpart in Vermont (Mike Adams) last year regarding Section 404/10 permitting. The total area of proposed temporary and permanent fill in the navigable waterway is approximately 0.72 acre in NH and 385 sq ft in VT. Since these impacts are below each State's threshold for an Individual Permit for work in navigable waters, and because there have been no public concerns raised about the project, Mike Hicks and Mike Adams indicated that the project could be authorized under each State's general permit. M. Hicks confirmed that the project would be authorized under the NH GP.

Impacts requiring mitigation were reviewed. Permanent impacts from the new pier footings (158 linear feet) and drainage work (59 linear feet) will require mitigation. Permanent impacts from scour protection (286 linear feet) were discussed. At a previous meeting, there had been consensus that the scour protection would not require mitigation since it would be protecting existing infrastructure. However, there was now concern over whether the scour protection would be protecting new or existing

infrastructure since each location of proposed A-Jacks would encompass two existing piers and one new middle pier. B. Colburn clarified that there is an existing scour concern at the existing piers, that the proposed work was not causing the scour concern, and that the scour protection would be needed in the same footprint as proposed even if the new pier footings were not proposed. Based on this discussion, there was agreement that mitigation would not be required for the scour protection. G. Infascelli noted that the permit application should clearly describe why scour protection is proposed.

The need to mitigate for temporary impacts from the proposed causeways was discussed. At the last meeting, Lori Sommer had suggested contacting Mike Johnson (National Marine Fisheries Service) about mitigation for the temporary causeways since they would be in place for up to 4 years. Mike Johnson was contacted and suggested that mitigation for the proposed causeways would be consistent with the Sarah Mildred Long project, which provided mitigation for impacts from a temporary causeway. However, DOT has concerns with requiring mitigation for the Connecticut River causeways. First, the Sarah Mildred Long causeway resulted in impacts to tidal wetlands, which would be more sensitive to changes in hydrology over a period of time, and impacts from small causeways along the banks of the Connecticut are not directly comparable. Second, Mike Johnson had previously reviewed the project through EFH consultation in 2014 and had no concerns with the project at that time, and now the Connecticut River is no longer subject to EFH consultations. Finally, the causeways will consist of stone fill placed within sheet piles and on geotextile fabric to minimize their footprint and disturbance to the streambed. The sizes of the causeways have been minimized and they will extend only 25' to 40' out from the bank. The causeways will be located in areas that were likely impacted by construction of the existing interstate bridges. Any effects to the river, which is 550' in width, would be minimal. All stone fill from the causeways will be removed following construction.

Mark Kern expressed some concern over impacts to aquatic habitat, such as compaction or other changes to the substrate, due to the amount of time the causeways would be in place and the time it would take for the habitat to recover. However, Carol Henderson noted that NH Fish & Game does not have concerns with impacts to the substrate. L. Sommer, M. Hicks, and M. Kern agreed that no mitigation for the temporary causeways would be required.

DOT has reached out to the Lebanon Conservation Commission and Upper Valley Land Trust for input on mitigation options. If no suitable projects are identified, then mitigation will be in the form of an in-lieu fee payment of \$53,746.56.

M. Hicks asked about coordination on the Coast Guard Bridge Permit and northern long-eared bat consultation. C. Perron responded that the US Coast Guard has concurred that the project is exempt from a Bridge Permit under Section 144(h), and that the project is federally funded and was reviewed under the Programmatic Consultation for northern long-eared bat.

The permit application will be submitted in approximately one month. The tentative advertising date for the project is June 2019, with the start of construction expected to be just over a year from now.

Submitted by:

Christine Perron
McFarland Johnson, Inc.

Note: Finalized minutes and the complete list of attendees will be available in the Conference Report for the August 15, Natural Resource Agency Coordination Meeting.

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: February 15th, 2017

LOCATION OF CONFERENCE: John O. Morton Building

ATTENDED BY:

NHDOT

Sarah Large
Ron Crickard
Mark Hemmerlein
David Kammer
Marc Laurin
Kevin Nyhan
Rebecca Martin
Jon Evans
Steve Johnson
Cassandra Burns
Stephanie Micucci
Bill Saffian
Sally Gunn
Don Lyford
Shaun Flynn
Samantha Fifield
C.R. Willkie
Joseph Adams
Michael Licciardi
Jon Hebert

Wendy Johnson
Bob Landry

EPA

Mark Kern

NHDES

Gino Infascelli
Lori Sommer
Pierce Rigrod

NHF&G

Carol Henderson
John Magee

NH Natural Heritage

Bureau
Amy Lamb

Consultants/Public

Participants

Dawn Tuomala
Jim Bouchard
Lisa Martin
Don Lussier
John Parrelli
Josif Bicja
Kimberly Peace
Sean James
Brad Harriman
Christine Perron
Brian Colburn
Matt Lundsted
Clint Mercer
David Kull
Jed Merrow

(When viewing these minutes online, click on an attendee to send an e-mail)

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Lebanon-Hartford, #16148 (A001(154))

This project was last reviewed at this meeting a year ago. Final design of the project has been progressing and permit applications are now being prepared. The purpose of today's meeting is to discuss proposed impacts and get concurrence on mitigation requirements.

Brian Colburn provided an overview of the project, which consists of the rehabilitation of the Interstate 89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT (Bridges 044/103 and 044/104). The existing superstructure steel will be replaced with new steel and an in-fill will be constructed in the gap between the bridges to provide a single 110' +/- wide bridge deck to facilitate traffic control. The in-fill will require new footings between each of the five pairs of existing piers, four of which are located in the river. The resulting bridge will allow for maintenance of traffic during phased construction. Following construction, the bridge will provide two through lanes in each direction and auxiliary lanes between Exit 20 and I-91 ramps. Three stormwater treatment areas will be constructed to treat runoff. Infiltration basins will be located on the north side of the interstate in both NH and VT, and a treatment swale will be located on the south side of the interstate in NH.

Three piers require scour protection. The fourth, westernmost pier in the river is located on bedrock and does not need scour protection. A-Jacks concrete armor units are proposed for the three piers. Mats of these interlocking units would be constructed on land or a barge and then lowered by crane to the river bottom around each pier. The mats would be placed on top of the channel substrate. Since no excavation or placement of bedding materials will be required for the A-Jacks, the use of cofferdams will be limited to the footprint of the new pier footings.

Due to the new piers and scour protection, the work as proposed would result in an increase in base flood elevation of 0.04'. Since this area does have a history of flooding during 100-year storm events, mitigation will be incorporated into the project to avoid any increase in base flood elevation. Proposed mitigation will entail benching into the VT bank to create a narrow shelf, staying approximately 1' above ordinary high water. To achieve a zero increase in flood elevation, the bank will be benched along a distance of 388 feet. Stone will be placed to stabilize the new slope. Much of this area is located under the bridges and is currently stone. When this project was last discussed with the resource agencies, benching along the NH bank was discussed. It has since been determined that benching on this side of the river would require dredging in the river or cutting into a larger area of bank to achieve a zero increase in flood elevation. The VT bank is steeper and more conducive to benching. The bench will also provide some benefit to wildlife traversing the steep bank.

When reviewing the profile view of the proposed benching, Gino Infascelli commented that it would be helpful to include the location of the State line and OHW on all profile views to more clearly show where impacts are located.

To provide flexibility to the Contractor in locating a temporary construction trestle, a large footprint of temporary impact will be included in the permit application and a work trestle across the full width of the Connecticut River is assumed. Fingers off the main trestle would be needed to access each pier. A temporary causeway/work platform would be needed off each bank of the river to provide a platform from which the trestle would be constructed. A small work platform may also be needed under the bridge between the NH bank and first pier. The trestle and causeways would be in place for the duration of construction, which is expected to be up to four years. The Contract could provide an upper limit of the number of trestle piles that would be allowed. The Contractor will also be given the option to access the Vermont pier from the Vermont side of the river; however, this option will require a temporary railroad crossing, which could become costly due to flagger and insurance requirements. If the Contractor chooses this option, a portion of the trestle would not be needed.

Based on the typical types of boats that would likely be found on this section of the river, between six to eight feet of clearance is needed to pass under a structure. The elevation of ordinary high water in this location is 331' and the 10-year event is 342'. There will be a stipulation in the contract that the Contractor must construct at least one section of the temporary trestle above the elevation of the 10-year event. This would provide adequate clearance for boaters during most flow conditions.

Christine Perron provided a summary of proposed impacts. These totals may change slightly as areas are refined on the wetland impact plans.

Permanent wetland impacts: 1,101 sq ft

Permanent bank impacts from drainage work: 599 sq ft

Permanent channel impacts from the new footings: 3,118 sq ft

Permanent channel impacts from scour protection: 20,559 sq ft

Temporary impacts from causeways: 5,901 sq ft

Temporary impacts from trestle/construction footprint: 88,999 sq ft (Actual impacts from the trestle would be limited to the piles that support the trestle, which would be a total of approximately 600 sq ft.)

Total permanent: 25,377 sq ft

Total temporary: 94,900 sq ft

Temporary impacts to Vermont side of the river: 802 sq ft

C. Perron noted that she has been coordinating with Mike Hicks regarding Section 404/10 permitting. The total area of proposed temporary and permanent fill in the navigable waterway is approximately 0.69 acre in NH and 802 sq ft in VT. Since these impacts are below each State's threshold for an Individual Permit for work in navigable waters, and because there have been no public concerns raised about the project, M. Hicks has confirmed that the project can be authorized under each State's general permit. Mike Adams of the Corps confirmed that the application for VT impacts should be sent to the Vermont office.

Impacts requiring mitigation were reviewed. Permanent impacts from the new footings (158 linear feet) and drainage work (50 linear feet) will require mitigation. Permanent palustrine wetland impacts (1,100 sq ft) will also require mitigation. The temporary impacts from the causeways may also require mitigation since these will be in place for up to 4 years. Since the river is designated as Essential Fish Habitat, Lori Sommer asked that Mike Johnson be contacted for input on the need for providing mitigation for the temporary causeways. Subsequent to the meeting, C. Perron contacted M. Johnson, and he requested that the NOAA Habitat Equivalency Analysis be used to determine the appropriate area to mitigate for temporary habitat loss from the causeways. The Sarah Mildred Long bridge project constructed a causeway that will be in place for three years. A recovery time of 3 years was used for this impact. Using this example, mitigation for the proposed causeway impacts in the Connecticut River would need to account for the duration of construction (4 years) plus full recovery time (3 years).

The Department's preference for mitigation is an in-lieu fee payment. L. Sommer asked that the City of Lebanon and Upper Valley Land Trust be contacted to determine if there are any appropriate projects that could be funded as mitigation. Following this coordination and the completion of the Habitat Equivalency Analysis, a mitigation proposal will be confirmed with DES. The in-lieu fee should be determined by using the DES stream calculator for linear feet of impact to the river and banks and the wetland calculator for square feet of impact to palustrine wetlands.

Carol Henderson asked if Mike Johnson was already aware of the proposed scour protection. C. Perron clarified that the scour protection had been included in the EFH Assessment that M. Johnson approved two years ago. The temporary causeways were not previously reviewed by M. Johnson.

Other resources were reviewed. Dwarf wedgemussels occur one mile downstream of the project and the USFWS had no concerns regarding this species when contacted in 2013.. Subsequent to the meeting, the USFWS confirmed that there are still no concerns regarding this species. Time of year restrictions will be implemented for tree clearing to avoid potential impacts to northern long-eared bat. The bridge was reviewed with binoculars for signs of bat usage, and close-up bridge inspection photographs of the bridge were also reviewed. No evidence of roosting has been observed. There are no known maternity roost trees or hibernacula in the vicinity of the project. A Project Submittal Form has been sent to USFWS by NHDOT with a finding of May Effect, Not Likley to Adversely Affect. The project was reviewed with NH Fish & Game and there were no concerns regarding bald eagle or cobblestone tiger beetle. Section 106 consultation has resulted in a determination of No Historic Properties Affected. The US Coast Guard has concurred that the project is exempt from a Bridge Permit under Section 144(h).

M. Hicks asked if there is a local harbor master or similar entity for this area that could be notified about impacts to recreational boating during construction. The Connecticut River Joint Commissions is aware of the project and will receive a copy of the permit application. M. Hicks also asked about the substrate of the river, which is predominantly sand and gravel at the bridge site. M. Hicks asked about public input received on the project. There has been one Public Officials Meeting with Lebanon City Officials and a Public Informational Meeting. Letters have also been sent to Lebanon and Hartford boards and organizations. No concerns about the project have been raised.

A survey for the state listed mudflat spikesedge was completed in October 2015 and the plant was not found in the project area. Amy Lamb noted that a number of new occurrences of this species were located along the river during the recent drought when the water level was lower than normal. She recommended checking the project area again for this plant if the water levels remain low enough.

The permit application is expected to be submitted to DES in late April.

This project has been previously discussed at the 5/21/2014, 11/19/2014, and 2/17/2016 Monthly Natural Resource Agency Coordination Meetings.

Walpole-Charlestown, #14747 (X-A004(487))

Jon Evans began by providing a brief overview of the project's history to date and that the project had been reviewed at several prior meetings with the last being March 16, 2016. J. Evans also noted that the goal of this meeting was to review current estimated wetland impacts and determine USACE permitting needs. Matt Lundsted took over by running through a short presentation summarizing that the current proposed alternative (western alignment shift away from the railroad and Fall Mountain) removes physical impacts to the railroad tracks (property encroachment only), minimizes environmental impacts from blasting, avoids the rock cut and tree clearing to the east of the railroad, eliminates impacts to Fall Mountain State Forest and cuts construction costs and duration.

The presentation went on to outline typicals of what the slope work along the banks of the Connecticut River and Meany's Cove would look like detailing specific cross sections at three stations (one in the southern portion of the project into the Connecticut River, one through the Meany's Cove segment and one in the northern portion of the project into the Connecticut River). Finally permanent and temporary wetland and bank impacts in each community were summarized.

Lori Sommer inquired what the intent of the "potential construction platform" was for. Clint Mercer explained that the slope work to the southern end of the project is too high to construct from the top of

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: February 17, 2016

LOCATION OF CONFERENCE: John O. Morton Building

ATTENDED BY:

NHDOT

Matt Urban
Ron Crickard
Anthony Weatherbee
Kerry Ryan
Marc Laurin
Sam Fifield
Joe Adams
Carol Niewola
Jon Evans
Bob Juliano
Mike Dugas
Keith Cota

Army Corps of Engineers

Michael Hicks

NHDES

Gino Infascelli
Lori Sommer
Katie Zink
Greg Cummings
Deb Loiselle

NH Fish & Game

Carol Henderson

NHB/DRED

Amy Lamb

**Consultants/Public
Participants**

Jed Merrow
David Nelson
Christine Perron
Rick Dymont
Brian Colburn
Josh Lund
Rob Faulkner
Bill Ashford
David McNamara
Vicki Chase
Jennifer Riordan
John Trottier
Chris Bean
Ian Broadwater
Mark Hutchins
Leo Tidd

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(When viewing these minutes online, click on a project to zoom to the minutes for that project)

decrease in impervious surface. Stub taxiways between Taxiway B and the runway may be relocated. There will be minor drainage improvements but no change in drainage patterns or infrastructure. There is an ongoing erosion problem north of the Runway 18 end that should be addressed. If excess material is available from the taxiway project, it could perhaps be used to fill in the erosional area. The erosional area has groundwater seepage, intermittent channels, and delineated wetlands. Stone fill may be the best solution for this area. Other areas to stockpile excess material (if any) have not yet been identified, but could be on airport property.

There are four small pocket wetlands, estimated at 6,000 square feet but later determined to be 8,323 square feet overall, between the east end of Taxiway B and Runway 7-25. The taxiway rehabilitation work may result in the filling of these wetlands. Lori Sommer noted that, since the proposed work will occur within 5 years of previous wetland impact projects at the airport, mitigation for the proposed project will be required for cumulative wetland impacts. An in-lieu fee would be the most likely form of mitigation. The airport will set up a meeting with the Lebanon Conservation Commission to discuss impacts and mitigation during the design and permitting process.

Based on the former runway safety area project work, there are two state-threatened plant species in the vicinity. Fringed gentian has been found on airport property, and barren strawberry has been found nearby. An updated rare species query needs to be submitted to the Natural Heritage Bureau. It may be necessary to check for these plants within the impact area prior to construction.

As this is still being designed, Gino Infascelli noted that the grading plans must show why there is a need for impacting the infield wetlands.

The project is planned to be advertised for construction bids in April, and permits should be obtained by May 1. The state dredge and fill application will need to be submitted as soon as possible to meet the schedule.

Lebanon-Hartford, 16148, A001(154)

Brian Colburn provided an overview of the project, which consists of the rehabilitation of the Interstate 89 bridges over the Connecticut River between Lebanon, NH and Hartford, VT (Bridges 044/103 and 044/104). The existing superstructure steel will be replaced with new steel and an in-fill will be constructed in the gap between the bridges to provide a single 110' +/- wide bridge deck to facilitate traffic control. The in-fill will require new footings between each of the four pairs of existing piers. The resulting bridge will provide 2 through lanes in each direction and auxiliary lanes between Exit 20 and I-91 ramps, and will require realignment of I-89 on both approaches.

Construction access issues were summarized. Construction access to the western-most bridge pier could be achieved from Connecticut River Road with an access road built along the railroad, beginning at a point where Connecticut River Road and the railroad are at the same elevation, approximately 600 feet north of the bridge. Much of this access road could be constructed by bringing in fill material. A temporary crossing of the railroad would be required. This option would require coordination with the railroad, which sees daily passage of freight and passenger trains, and this coordination can become costly due to flagger and insurance requirements.

A second option to access the westernmost pier is from the New Hampshire side of the river. This option would involve constructing a work trestle across the full width of the Connecticut River. The Contractor would have the option of placing this trestle on either the upstream or downstream side of the bridge. Fingers off the main trestle would be needed to access each pier. A temporary causeway would be needed off each bank of the river to provide a platform from which the trestle would be constructed. The trestle would be in place for the duration of construction, which is expected to be approximately three years.

Based on available information, it appears the portages in this area of the river are for car-top access such as canoes and kayaks. The State of Oregon *Minimum Channel Clearance Guidelines for Recreational Boating* was located online and provides minimum height clearances for typical boat types. Based on the typical types of boats that would likely be found on this section of the river, between six to eight feet of clearance is needed to pass under a structure. The elevation of ordinary high water in this location is 331' and the 10-year event is 342'. There will be a stipulation in the contract that the Contractor must construct at least one section of the temporary trestle above the elevation of the 10-year event. This would provide adequate clearance for boaters during most flow conditions.

Carol Henderson commented that this section of the river may be used for bass fishing, which involves boats larger than a canoe or kayak. Based on the minimum clearances in the Oregon guidance, the trestle as proposed would provide adequate clearance for boats up to 27' in length. It was agreed that this would be adequate for bass boats.

Josh Lund provided an overview of proposed scour protection measures. Three of the four piers require scour protection. The fourth, westernmost pier is located on bedrock and does not need scour protection. A-Jacks concrete armor units are proposed for the three piers. Mats of these interlocking units would be constructed on land or a barge and then lowered by crane to the river bottom around each pier. The mats would be placed on top of the channel substrate, with no excavation or placement of bedding materials required. The work would be facilitated by divers.

Due to the new piers and scour protection, the work as proposed would result in an increase in base flood elevation of 0.05'. To compensate for this increase in flood elevation, bank cuts are proposed in order to widen the capacity of the river during flood events and create a zero increase in flood elevation. This would entail cutting into the river bank to create a narrow shelf, staying about one foot above ordinary high water. The bank cut could also make it easier for wildlife to traverse the river banks under the bridges. This floodplain mitigation could be achieved with a bank cut entirely on the Vermont bank, or a combination of the NH and VT banks. As shown on the plans for purposes of discussion, the bank cut extends the width of the right-of-way, which is approximately 432 linear feet of bank. From a wildlife passage perspective, the bank cut would have more value on the Vermont bank, which is steeper and higher than the NH side.

Christine Perron provided an overview of preliminary wetland impacts:

Permanent channel impacts from the new footings: 3,119 sq ft

Permanent channel impacts from scour protection: 17,498 sq ft

Permanent bank impacts from floodplain mitigation ("worst case" scenario): 3,508 sq ft (432 LF)

Permanent palustrine wetland impacts (NH): 1,531 sq ft

Temporary impacts: overall footprint to be permitted will be 92,706 sq ft. This includes 3,800 sq ft for 3 areas of temporary causeway, plus adequate area to allow contractor to choose where to construct the trestle. Actual impacts from the trestle would be limited to the piles that support the trestle, which would be a total of approximately 600 sq ft.

The project will require a NH Dredge & Fill Permit, which will be classified as a major impact permit since this is a Tier 3 stream crossing. In addition, the project will require a permit from the Army Corps, a

Shoreland Permit by Notification, a VT River Corridor Permit, and VT Stormwater Discharge Permit. Additional federal approvals were reviewed. The US Coast Guard has concurred that the project is exempt from a Bridge Permit under Section 144(h). The Coast Guard is requiring coordination just prior to construction to review construction plans. Mike Johnson from the National Marine Fisheries Service reviewed the project a year ago and had no concerns regarding Essential Fish Habitat. However, the scour protection measures were not known when the EFH Assessment was completed, so additional coordination with NMFS will be necessary. Dwarf wedgemussels occur one mile downstream of the project; the USFWS has no concerns regarding this species. Northern long-eared bat may occur in the area. This species will be addressed in the coming months as limits of tree clearing become better defined. Finally, Section 106 consultation has been underway. There are three areas of archaeological sensitivity on the VT side of the project area. Only one of these areas may be impacted for construction access, and a survey will be completed in the spring to determine if the area contains significant resources. There are no historical or archaeological resource concerns on the NH side of the project. A determination of No Historic Properties Affected is anticipated for the overall project, pending the results of the archaeological survey.

Regarding the Army Corps Section 404/Section 10 Permit, C. Perron noted that the impact threshold for an Individual Permit for work in navigable waters in NH is 1 acre. The project as proposed will result in approximately 0.56 acres of impact from permanent and temporary fills, so the project may qualify for the NH General Permit. This total includes impacts from the new footings, scour protections, and temporary causeways. Impacts within the VT-owned portion of the river have not been quantified yet, although it is anticipated that VT impacts will only be temporary in nature and would qualify for authorization under the VT General Permit. The US Route 4 bridge replacement project that was completed a few miles upstream was covered by both the VT and NH General Permits.

Mike Hicks commented that the thresholds in the General Permits are advisory only. Other factors need to be taken into consideration as well when determining the need for an Individual Permit, such as public concerns and the concerns of other resource agencies. He needed to consider the project further before making a determination on permit requirements. B. Colburn noted that the project has been presented to town officials of Lebanon and Hartford, as well as the general public, and no concerns with the project have been raised.

M. Hicks asked if the need for a Section 408 permit had already been determined. C. Perron replied that she has an email from the Army Corps that states the 408 permit would not be needed. She would forward the email to Mike.

C. Perron asked for input on mitigation requirements that will need to be taken into consideration as impacts are finalized. She noted that it was assumed that the permanent channel impacts from the new footings would require mitigation, and it was also assumed that impacts from scour protection would not require mitigation since the impacts were necessary for the protection of existing infrastructure. Both L. Sommer and Gino Infscelli concurred. Regarding the impacts from proposed bank cuts, C. Perron noted that it was hoped that wetland mitigation would not be required since these impacts were proposed only for floodplain mitigation. L. Sommer and G. Infscelli did not agree with this and commented that mitigation for linear bank impacts would be required. In addition, mitigation will also be required for the temporary impacts resulting from the proposed causeways.

G. Infscelli asked that other options be explored for floodplain mitigation to determine if feasible alternatives to the bank cutting concept exist. L. Sommer noted if the bank cutting concept is carried forward, her preference would be to limit the impacts to one bank rather than impact both banks. In general, there are concerns regarding the bank cutting concept. C. Perron noted that the concept will be discussed with VT resource agencies to get additional feedback.

M. Hicks suggested that a site visit with agencies from both states would be beneficial. This could be scheduled in the spring. Based on the current project schedule, permit applications will be submitted in mid-summer of this year. It is anticipated that the project will be discussed at least once more at a Natural Resource Agency Meeting prior to application submittal.

Northfield-Tilton, 16147&14744A, X-A001(153) & A001(042)

This project involves rehabilitation and pier scour protection for two bridges carrying I-93 over the Winnepesaukee River in Tilton and Northfield. The two projects will be advertised as one contract. Vicki Chase introduced the project, which is located just south of Exit 20 on I-93. The subject bridges cross over the Winnepesaukee River and the New Hampshire Railroad. The existing bridges which were built in 1960 and reconstructed in 1980.

V. Chase provided an overview of existing natural resources at the site.

- The Winnepesaukee River is a 5th order Tier 3 Stream that drains all of the lakes region – the drainage area = 467 square miles. Silver Lake lies directly upstream which is not controlled by damming.
- The NHB check for the project indicated that there were Bald Eagles and Narrow-leaved Arrowhead at the site. NHFG has confirmed that they have no concerns with bald eagles. A survey was undertaken for narrow-leaved arrowhead and the plant was not found.
- The river is impaired by non-native aquatic species (milfoil).
- Northern Long-Eared Bat coordination will take place under the agreement between USFW and FHWA.
- An Essential Fish Habitat assessment was undertaken by Normandeau because of the potential for Atlantic Salmon in the river. It was determined that there would be no effect to salmon habitat and NHFS has concurred.
- Coordination for floodplain and floodways is ongoing. There will be fill within the mapped floodway, and NEPA requires that the project must demonstrate that there will be no impact to the base flood elevation.
- The Winnepesaukee River Trail parallels the river and will be used for construction. DOT will be coordinating with the town to acquire clearance under Section 4(f).
- The project will require a major impact wetland permit.

Dave McNamara described the deck rehabilitation. The decks are in poor condition and other elements are deteriorating, necessitating a full deck replacement. Alternative were studied for traffic control, and the preferred alternative uses full crossovers with traffic moving to each bridge as the other bridge is rehabilitated, with one lane of traffic being maintained on the bridge being rehabbed. There is a median wetland that will be temporarily impacted by the crossovers, which will be restored to its existing condition.

Bill Ashford introduced the scour mitigation project. The purpose of the project is to protect the center and southern piers which are scour critical. Permanent impacts will involve adding riprap to the existing riprap around the southern piers and installing precast concrete “A-Jacks” around the center piers. For the center piers existing material will be excavated, bedding material installed, A-Jacks installed, and re-use of the existing stream bed to be material placed over the A-Jacks (no net

Mitigation

Lebanon, NH - Hartford, VT, 16148
Mitigation Narrative

This project requires compensatory mitigation per Env-Wt 302.03 for permanent impacts to the bank and channel of the Connecticut River.

Proposed mitigation was discussed most recently at the August 15, 2018 NHDOT Natural Resource Agency Coordination Meeting.

Impacts requiring mitigation are as follows:

Permanent impacts to channel from new pier footings = 158 linear feet

Permanent impacts to bank for drainage work = 59 linear feet

Total bank and channel impacts to be mitigated = 217 linear feet

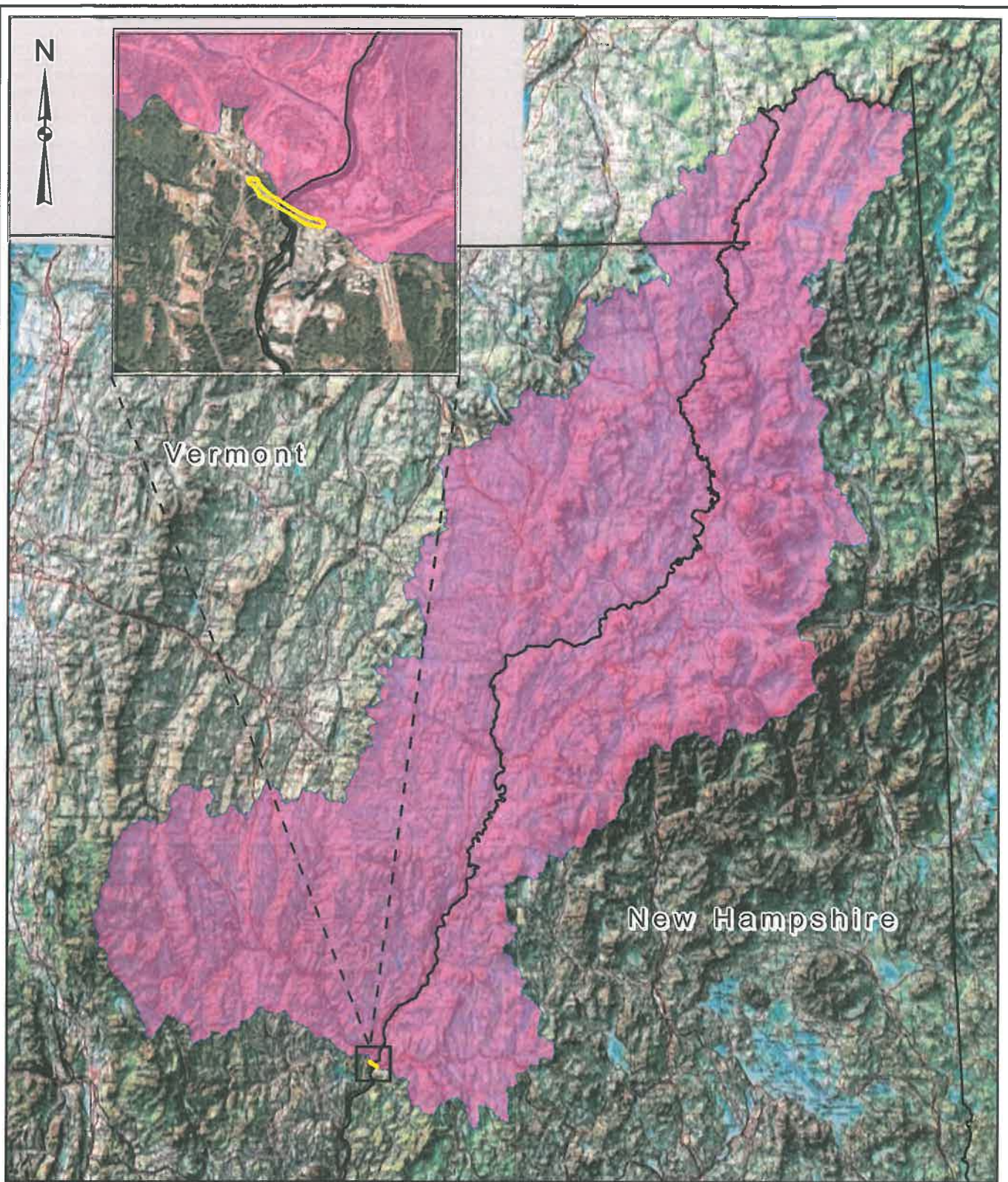
The NHDES Aquatic Resource Mitigation Fund Stream Payment Calculator was utilized to determine the total ARM Fund stream payment of ***\$53,746.56***.


As discussed at the Natural Resource Agency meeting, mitigation would not be required for the scour protection proposed for two piers. There is an existing scour concern at the existing piers and the proposed work is not causing the scour concern. The scour protection would be needed in the same footprint as proposed even if the new pier footings were not proposed. Therefore, the proposed scour protection will be protecting existing infrastructure, which does not require mitigation per Env 302.03(c)(2)c.

**NHDES AQUATIC RESOURCE MITIGATION FUND
STREAM PAYMENT CALCULATION**

INSERT LINEAR FEET OF IMPACT on BOTH BANKS AND CHANNEL	Right Bank	
	Left Bank	59.0000
	Channel	158.0000
	TOTAL IMPACT	217.0000
	Stream Impact Cost:	\$44,788.80
	NHDES Administrative cost:	
		\$8,957.76
***** TOTAL ARM FUND STREAM PAYMENT*****		
		\$53,746.56

Watershed Boundary Map



-  Approximate Project Area
-  Connecticut River Watershed

0 5 10 20 30 40
Miles

NHDOT
LEBANON, NH - HARTFORD, VT 16148

Connecticut River Watershed

SCALE:
1 in = 16 miles

DATE:
JANUARY 2017

FIGURE:
3

 **McFarland Johnson**

Env-Wt 904.09 Alternative Design Technical Report

**NH Department of Transportation
Bureau of Bridge Design
Lebanon-Hartford 16148
Env-Wt 904.09 Alternative Design
TECHNICAL REPORT**

Env-Wt 904.09(a) - If the applicant believes that installing the structure specified in the applicable rule is not practicable, the applicant may propose an alternative design in accordance with this section.

Please explain why the structure specified in the applicable rule is not practicable (Env-Wt 101.69 defines practicable as *available and capable of being done after taking into consideration costs, existing technology, and logistics in light of overall project purposes.*)

The Connecticut River has a watershed of 4,286 square miles at the Interstate 89 bridges. The bankfull width at the location of the bridges is approximately 550 feet. The NH Stream Crossing Guidelines recommends crossings that are at least 1.2 times bankfull width plus 2 feet, resulting in a structure that spans the channel and at least a portion of the floodplain and provides for the adequate passage of water, sediment, aquatic biota, and organic matter at all flow levels.

Based on the metric used in the Stream Crossing Guidelines, the recommended span at this location would be 662 feet. The existing bridges are 840 feet long and currently provide adequate passage of water, sediment, aquatic biota, and organic matter at all flow levels. The bridges span the entire width of the river, as well as the New England Central Railroad in Vermont and a gravel access road in New Hampshire. There are four pairs of piers in the river channel and another pair located at the top of the Vermont bank.

The proposed project will install new piers in the middle of each pair of piers to allow for construction of a bridge in-fill in the gap between the Northbound and Southbound bridges. The project will also include the installation of scour protection around two piers due to existing scour concerns at these two locations. The proposed bridge rehabilitation will result in a 0.5-inch increase in base flood elevation. Mitigation will be incorporated in the project to negate the project's impact on the base flood elevation.

Rehabilitation without widening was considered. However, this alternative would not address the sub-standard bridge width and insufficient merge distance, both of which are safety concerns on this high-volume interstate. Widening the bridges to the outside was considered. However, this would result in greater impact to the river with a larger pier footprint. To determine if widening the bridges could be accomplished without permanent river impacts, connecting the existing piers with extended pier caps to support the new in-filled superstructure was studied. This option would use top-down construction and eliminate the need for new piles in the river. However, it was determined that the piles and upper portion of the pier stem would be significantly overstressed due to the induced frame action inherent with this option. Therefore, this alternative was not selected. Complete replacement of these bridges is not warranted by their current condition. Replacing the bridges with longer spans that reduce or eliminate piers in the river is not practicable given that 1) rehabilitation addresses the project's purpose and need; 2) longer spans would result in greater impacts during construction; and 3) the replacement alternative would cost substantially more than rehabilitation.

For these reasons, widening the bridges to the inside is considered the most practicable alternative.

The proposed alternative meets the specific design criteria for Tier 2 and Tier 3 crossings to the maximum extent practicable, as specified below.

Env-Wt 904.05 Design Criteria for Tier 2 and Tier 3 Stream Crossings – New Tier 2 stream crossings, replacement Tier 2 crossings that do not meet the requirements of Env-Wt 904.07, and new and replacement Tier 3 crossings shall be designed and constructed:

(a) In accordance with the NH Stream Crossing Guidelines.

The existing bridges are 840 feet long with five piers and currently provide adequate passage of water, sediment, aquatic biota, and organic matter at all flow levels. The bridges span a portion of upland on either side of the river.

(b) With bed forms and streambed characteristics necessary to cause water depths and velocities within the crossing structure at a variety of flows to be comparable to those found in the natural channel upstream and downstream of the stream crossing.

The project involves 840-foot spans across the river. The existing streambed will not change except for areas where new pier footings and scour protection are proposed. With proposed floodplain mitigation (see (e) below), water depths at high flows will not change. The new piers and footings will be between the existing piers and footings and will be identical in shape and size. This configuration will minimize any effect on water velocities.

(c) To provide a vegetated bank on both sides of the watercourse to allow for wildlife passage.

The existing bridges currently span a portion of land adjacent to the river on both sides. The NH side of the river consists of a gravel access trail that travels under the bridges and connects the two parcels of conservation land on either side of I-89. Herbaceous and shrubby vegetation exists under the bridges and wildlife can travel under the bridges on the access trail along the bank. The VT side of the river consists of an active railroad that travels parallel to the river under the I-89 bridges. The river bank between the river and the railroad is steep within the project area. The proposed bank benching along the VT bank (see (e) below) will improve the potential for wildlife passage along this side of the river.

(d) To preserve the natural alignment and gradient of the stream channel, so as to accommodate natural flow regimes and the functioning of the natural floodplain.

The existing alignment and gradient of the river channel will not change as a result of this project. The proposed bridge widening with floodplain mitigation (see (e) below) will not change the river's flow regimes or access to areas of natural floodplain.

(e) To accommodate the 100-year frequency flood, to ensure that (1) there is no increase in flood stages on abutting properties; and (2) flow and sediment transport characteristics will not be affected in a manner which could adversely affect channel stability.

The existing bridges accommodate the 100-year flood. However, due to the proposed in-fill between the existing piers and the proposed scour protection around 2 piers, the proposed work would result in an increase in base flood elevation of 0.04 feet (0.5"). To mitigate for this impact, the VT river bank will be benched to create a narrow shelf approximately one foot above ordinary high water. The bench will be created along 388 linear feet of bank. This bench will eliminate the increase in base flood elevation. This concept was reviewed for geotechnical and constructability concerns. It was concluded that the bank cut would not negatively impact the bridge pier. The 10-foot clayey-silt layer is stiff, has low compressibility, and is non-plastic. Within the areas of the pier foundation, the pier piles act as reinforcing of the slope between the river and the railroad and no impacts to the railroad are anticipated. With this mitigation, the project will result in no change to the 100-year flood elevation. The proposed mitigation will be above ordinary high water and will not impact channel stability.

(f) To simulate a natural stream channel.

The bridges span the entire width of the river channel and the proposed project will not change the length of the spans. Stream simulation is not needed.

(g) So as not to alter sediment transport competence.

Sediment transport competence will not be altered by the proposed project.

Env-Wt 904.09(c)(3) – The alternative design must meet the general design criteria specified in Env-Wt 904.01:

Env-Wt 904.01

(a) Not be a barrier to sediment transport;

The proposed project will not prevent the transport of sediment.

(b) Prevent the restriction of high flows and maintain existing low flows;

The project will not change existing low flows. Due to the proposed in-fill between the existing piers and the proposed scour protection around 2 piers, the proposed work would result in an increase in base flood elevation of 0.04 feet (0.5"). To mitigate for this impact, the VT river bank will be benched to create a narrow shelf approximately one foot above ordinary high water. With this mitigation, the project will not result in an increase in base flood elevation.

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;

The proposed project will not obstruct or substantially disrupt the movement of aquatic organisms during or after construction.

(d) Not cause an increase in the frequency of flooding or overtopping of banks;

The existing bridges accommodate the 100-year flood. However, due to the proposed in-fill between the existing piers and the proposed scour protection around 2 piers, the proposed work would result in an increase in base flood elevation of 0.04 feet (0.5"). To mitigate for this impact, the VT river bank will be benched to create a narrow shelf approximately one foot above ordinary high water. This bench will eliminate the increase in base flood elevation and the project will not cause an increase in flooding frequency.

(e) Preserve watercourse connectivity where it currently exists;

Watercourse connectivity currently exists and will be preserved.

(f) Restore watercourse connectivity where: (1) Connectivity previously was disrupted as a result of human activity(ies); and (2) Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both;

Watercourse connectivity currently exists and will be preserved.

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

A-Jacks concrete armor units are proposed around two piers to stabilize the river bed and prevent continued scouring around the pier footings. The proposed bank bench along the VT bank will be located above Ordinary High Water and will be accessed by the river only during larger flow events. The bench will be tapered at each end to avoid abrupt changes that could lead to scour. The new piers and footings will be between the existing piers and footings and will be identical in shape and size. This configuration will minimize any effect on river currents and water velocities.

(h) Not cause water quality degradation.

This segment of the river is listed on the NHDES 2016 303(d) List for E. coli contamination from combined sewer overflows. Vermont's 2012 List of Priority Surface Waters identifies this portion of the river as impaired for aquatic life support by flow alteration caused by fluctuating flows associated with the Wilder Dam. The proposed project will not change the conditions responsible for these impairments.

Runoff from the project area is not currently treated before entering the river. The project will result in a net increase of 0.9 acres of impervious area in NH. Two permanent stormwater treatment BMPs are proposed: an infiltration basin on the north side of I-89 and a treatment swale on the south side. These BMPs will treat runoff from approximately 2.82 acres of impervious area. In VT, the project will result in an increase of 0.5 acres of impervious area. An infiltration basin is proposed in VT on the north side of I-89 and will treat runoff from approximately 2.04 acres of impervious area. Treating more impervious surface than will be added on the bridge approaches will offset the additional impervious deck area over the river that will discharge directly into the river through scuppers in the bridge deck. For this reason, the project is not expected to impact overall water quality in the project area.

All appropriate erosion and sedimentation control measures will be utilized to avoid adverse impacts to water quality during construction.

For these reasons, the proposed project is not expected to cause water quality degradation.

NHB DataCheck Results Letter



NEW HAMPSHIRE NATURAL HERITAGE BUREAU
NHB DATACHECK RESULTS LETTER

To: Christine Perron, McFarland Johnson
53 Regional Drive

Concord, NH 03301

From: NH Natural Heritage Bureau

Date: 7/26/2018 (valid for one year from this date)

Re: Review by NH Natural Heritage Bureau of request submitted 7/24/2018

NHB File ID: NHB18-2339

Applicant: Christine Perron

Location: Lebanon
I-89 over the Connecticut River

Project Description: Bridge rehabilitation and widening of the two bridges (northbound and southbound lanes) that carry I-89 over the Connecticut River

The NH Natural Heritage database has been checked by staff of the NH Natural Heritage Bureau and/or the NH Nongame and Endangered Species Program for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government.

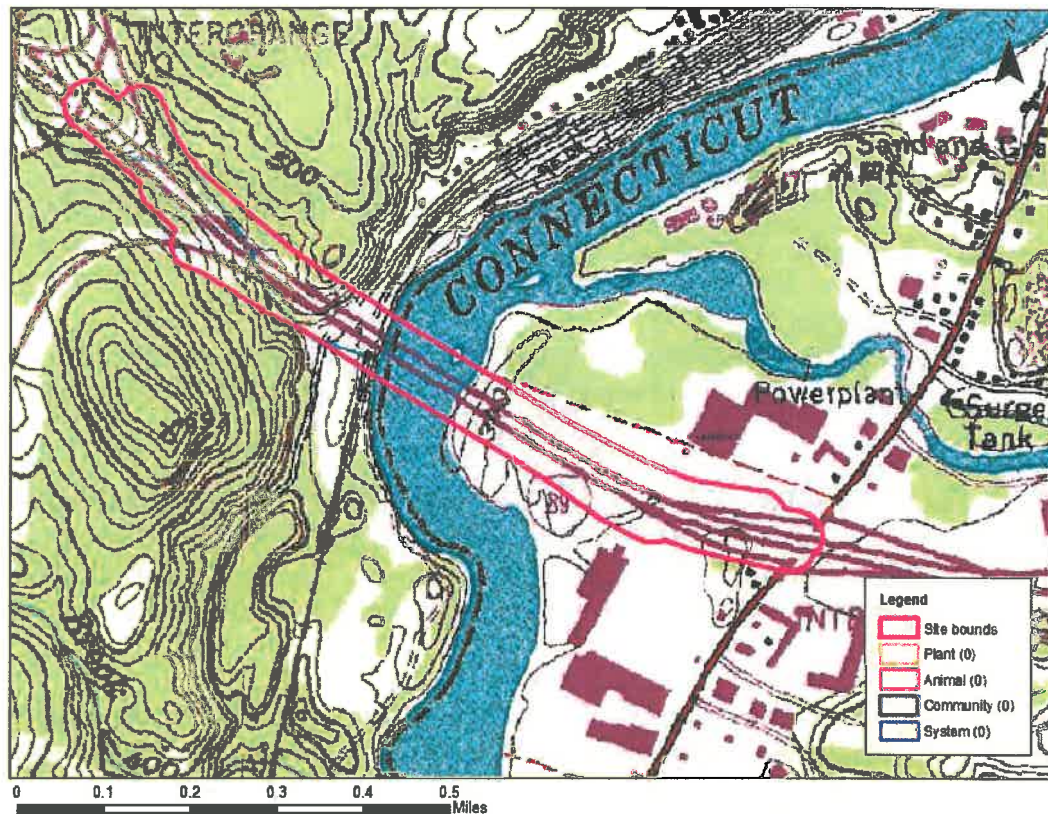
It was determined that, although there was a NHB record (e.g., rare wildlife, plant, and/or natural community) present in the vicinity, we do not expect that it will be impacted by the proposed project. This determination was made based on the project information submitted via the NHB Datacheck Tool on 7/24/2018, and cannot be used for any other project.



NEW HAMPSHIRE NATURAL HERITAGE BUREAU
NHB DATACHECK RESULTS LETTER

MAP OF PROJECT BOUNDARIES FOR: NHB18-2339

NHB18-2339



Memo



NH NATURAL HERITAGE BUREAU
NHB DATACHECK RESULTS LETTER

To: Stephen Hoffmann
53 Regional Drive
Concord, NH 03301

From: Amy Lamb, NH Natural Heritage Bureau

Date: 1/23/2017 (valid for one year from this date)

Re: Review by NH Natural Heritage Bureau

NHB File ID: NHB17-0134

Town: Lebanon

Description: Bridge rehabilitation and widening of the two bridges (northbound and southbound lanes) that carry I-89 over the Connecticut River

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: This site is within an area flagged for possible impacts on the federally-listed *Alasmidonta heterodon* (dwarf wedgemussel) in the Connecticut River; federal consultation may be required. Please contact NH Fish & Game regarding wildlife concerns. An historic record for the rare plant mudflat spikesedge (*Eleocharis intermedia*) was also included in this review, because many historical spikesedge populations were rediscovered last year due to drought conditions that created more of the mudflat habitat that is required by these plants.

Invertebrate Species	State ¹	Federal	Notes
Cobblestone Tiger Beetle (<i>Cicindela marginipennis</i>)	E	--	Contact the NH Fish & Game Dept (see below).
Dwarf Wedge Mussel (<i>Alasmidonta heterodon</i>)	E	E	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).
Plant species	State ¹	Federal	Notes
mudflat spikesedge (<i>Eleocharis intermedia</i>)*	E	--	
Vertebrate species	State ¹	Federal	Notes
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	T	--	Contact the NH Fish & Game Dept (see below).

¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

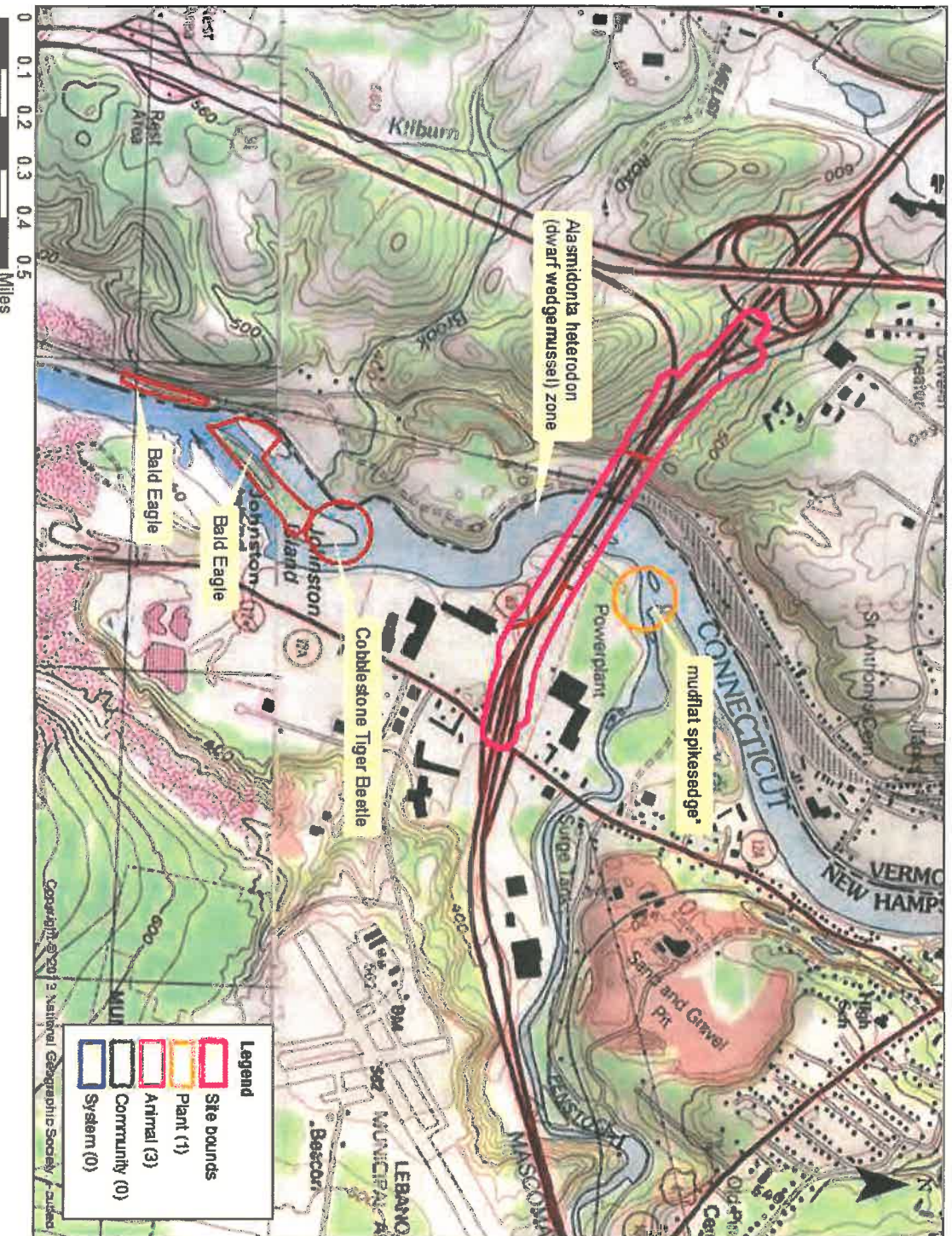
Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Rd.
Concord, NH 03301

NHB17-0134



New Hampshire Natural Heritage Bureau - Animal Record

Cobblestone Tiger Beetle (*Cicindela marginipennis*)

Legal Status

Federal: Not listed
State: Listed Endangered

Conservation Status

Global: Imperiled due to rarity or vulnerability
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Fair quality, condition and/or landscape context ('C' on a scale of A-D).
Comments on Rank:

Detailed Description: 2007: 18 observed. 2006: July 8: 8+ individuals; July 30: estimated 300+ individuals. 1993: Population present. 1989: 10 Beetles observed.

General Area: Cobblestone portion of island. Between high water and bank.

General Comments:

Management

Comments:

Location

Survey Site Name: Johnston Island

Managed By:

County: Grafton

Town(s): Lebanon

Size: 7.9 acres

Elevation: 340 feet

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Between Hartford, VT and West Lebanon, NH on Connecticut River, Johnson's Island.

Dates documented

First reported: 1989

Last reported: 2007-08-07

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

New Hampshire Natural Heritage Bureau - Plant Record

mudflat spikesedge (*Eleocharis intermedia*)**Legal Status**

Federal: Not listed
State: Listed Endangered

Conservation Status

Global: Demonstrably widespread, abundant, and secure
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Historical records only - current condition unknown.
Comments on Rank:

Detailed Description: 2012: Searched for, not found. 1879: Specimen collected.

General Area:

General Comments:

Management

Comments:

Location

Survey Site Name: Mascoma River, mouth of
Managed By: Bascetta

County: Grafton

Town(s): Lebanon

Size: 7.7 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 1879: Mouth of Mascoma River.

Dates documented

First reported: 1879-09

Last reported: 1879-09

New Hampshire Natural Heritage Bureau - Animal Record

Bald Eagle (*Haliaeetus leucocephalus*)

Legal Status

Federal: Not listed
State: Listed Threatened

Conservation Status

Global: Demonstrably widespread, abundant, and secure
State: Imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Fair quality, condition and/or landscape context ('C' on a scale of A-D).
Comments on Rank:

Detailed Description: 2002-2012: Wintering eagles regularly observed at locations along the Connecticut River, day perching and night roosts: 2012: 2 eagles observed at a single location on 1/7. Solitary eagles observed at 3 separate locations on 2/25. 2011: 2 eagles observed at a single location on 1/8. 2 eagles observed at a single location on 2/26. 2010: 3 eagles observed at a single location, 2 eagles observed at a single location, and a solitary eagle observed at a separate location on 1/9. 1 eagle observed on 2/27. 2009: 2 eagles observed at a single location on 1/10. 3 eagles observed at a single location, and a solitary eagle observed at a separate location on 2/28. 2008: 1 eagle observed on 1/12. 2 eagles observed at 2 separate locations on 2/23. 2007: Solitary eagles observed at 4 separate locations on 1/10. 2 eagles observed at 3 separate locations on 2/24. 2006: 3 eagles observed at a single location on 1/7. 2005: 2 eagles observed at a single location, and solitary eagles observed at 2 separate locations on 1/8. 2003: 1 eagle observed on 1/11. 2002: 3 eagles observed at a single location, and a solitary eagle observed at a separate location on 1/12. 1998: One adult (male?) starting 12/2/1997, joined by a second (female?) on 1/25/1998. 1993: Most perching observed between dam south to Rte. 4. Roosting near Rte. 5/91 intersection in White River Junction. Sightings near Lebanon dump (off Rte. 12a) and off River Road (opposite Ottauquechee River). 1991: Just 1 bird, perches frequently near dam, roosts in Vermont north of West Lebanon. Same bird has been returning for 8 years.

General Area: 1998: Tall pines on the bank of the Connecticut River, in the vicinity of a dam.

General Comments: 1998: Perch preference indicates that the male may be the same bird that has wintered in this area since 1981-82, and the female may be the same that has shared the area since 1992-93.

Management
Comments:

Location

Survey Site Name: Connecticut River, Hanover to Plainfield
Managed By: Mink Brook - South Esker

County: Sullivan

Town(s): Plainfield

Size: 173.5 acres

Elevation: 330 feet

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: From the mouth of the Ompompanoosuc River on the Connecticut River south to the mouth of the Ottauquechee River.

Dates documented

First reported: 1981

Last reported: 2012-02-25

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

NHB Correspondence

Christine J. Perron

From: Lamb, Amy [Amy.Lamb@dred.nh.gov]
Sent: Tuesday, March 15, 2016 12:25 PM
To: Christine J. Perron
Subject: RE: NHB review: NHB15-3706

Thank you Christine. We have no further concerns regarding rare plants for this project.

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323

NH Natural Heritage Bureau
DRED - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Christine J. Perron [mailto:CPerron@mjinc.com]
Sent: Tuesday, March 15, 2016 11:40 AM
To: Lamb, Amy
Subject: RE: NHB review: NHB15-3706

Thanks Amy. We completed a survey on the VT side of the river as well. There are areas of exposed mud flat habitat on the VT side but there was no evidence of *Eleocharis* species.

From: Lamb, Amy [mailto:Amy.Lamb@dred.nh.gov]
Sent: Tuesday, March 15, 2016 11:30 AM
To: Christine J. Perron
Subject: RE: NHB review: NHB15-3706

Hello Christine,

You are right, I never did send my final determination. Thank you for following up.

Thank you for completing the survey for *Eleocharis intermedia*. Based on the photos taken at the project site, the area appears to consist of primarily rocky shoreline, with little/none of the exposed mud flat habitat that the species prefers. NHB does not expect that this plant would be present in the project area, and does not have further concerns about this plant on the NH side of the river. Did you observe anything about the habitat on the VT side of the river?

Thank you,
Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323

NH Natural Heritage Bureau
DRED - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Christine J. Perron [<mailto:CPerron@mjinc.com>]
Sent: Tuesday, March 15, 2016 10:40 AM
To: Lamb, Amy
Subject: RE: NHB review: NHB15-3706

Hi Amy,

I'm starting to finalize the NEPA document for the Lebanon-Hartford project and just realized that I don't have the email memo from you regarding *Eleocharis intermedia*. I emailed you in December to let you know that Jed Merrow and I completed a survey for that species on October 8, 2015. We found that the NH side of the river through the project area is a rocky shoreline, with rocks extending into the water and dense vegetation located just above the rocks and, in some areas, extending almost to the edge of water. There were no mud flats in this area. The most common species were knotweed, reed canary grass, and purple loosestrife. We did not find any *Eleocharis*.

Do you have any further concerns with this species?

Thank you!
Christine

From: Lamb, Amy [<mailto:Amy.Lamb@dred.nh.gov>]
Sent: Friday, December 04, 2015 11:36 AM
To: Christine J. Perron
Subject: RE: NHB review: NHB15-3706

Hi Christine,

Attached please find our updated letter, which includes potential impacts to the federally-listed Dwarf Wedgemussel (*Alasmodonta heterodon*).

-Amy

(I will be sending my review follow-up memo separately.)

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323

NH Natural Heritage Bureau
DRED - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Christine J. Perron [<mailto:CPerron@mjinc.com>]
Sent: Friday, December 04, 2015 10:52 AM
To: Lamb, Amy
Subject: RE: NHB review: NHB15-3706

Hi Amy,

An email memo would be sufficient.

Thanks!
Christine

From: Lamb, Amy [<mailto:Amy.Lamb@dred.nh.gov>]
Sent: Friday, December 04, 2015 9:57 AM
To: Christine J. Perron
Subject: RE: NHB review: NHB15-3706

Hi Christine,

No, that won't be necessary – thank you though. I did want to give you a heads up, when I looked at the old reviews I noticed that the new one did not have the note about dwarf wedge mussel. Kim would like to edit the review memo to include the dwarf wedge mussel, as it was in previous reviews. We will be sending that out this afternoon.

In terms of the *Eleocharis*, did you need a formal memo from us, or is an email memo sufficient? Let me know what you need!

-Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323

NH Natural Heritage Bureau
DRED - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Christine J. Perron [<mailto:CPerron@mjinc.com>]
Sent: Thursday, December 03, 2015 4:03 PM
To: Lamb, Amy
Subject: RE: NHB review: NHB15-3706

Hi Amy,

The review number was NHB13-1182. I actually just realized that another review was completed in 2014: NHB14-4261.

A field report wasn't in our scope, but I could put a quick report together if you need one.

Thanks,
Christine

From: Lamb, Amy [<mailto:Amy.Lamb@dred.nh.gov>]
Sent: Thursday, December 03, 2015 3:49 PM
To: Christine J. Perron
Subject: RE: NHB review: NHB15-3706

Hi Christine,

Thanks for making me aware of the initial NHB request – do you happen to know what the NHB13-XXXX review number was? Thank you also for sending the photos; it does not look like appropriate habitat for the species based on the rocky

shoreline. Is there a field report (map/description of search area, etc.) that we could have for our records, or do you just have the photo log?

Best,
Amy

Amy Lamb
Ecological Information Specialist
(603) 271-2215 ext. 323

NH Natural Heritage Bureau
DRED - Forests & Lands
172 Pembroke Rd
Concord, NH 03301

From: Christine J. Perron [<mailto:CPerron@mjinc.com>]
Sent: Wednesday, December 02, 2015 10:51 AM
To: Lamb, Amy
Cc: Marc Laurin
Subject: RE: NHB review: NHB15-3706

Good morning Amy,

The subject review was requested to update one that was sent back in 2013. At that time, Melissa asked Vicki Chase to complete a plant survey for *Eleocharis intermedia*. Jed Merrow and I completed that survey on October 8, 2015. Photos from our field review are attached. The NH side of the river through the project area is a rocky shoreline, with rocks extending into the water and dense vegetation located just above the rocks and, in some areas, extending almost to the edge of water. There were no mud flats in this area. The most common species were knotweed, reed canary grass, and purple loosestrife. We did not find any *Eleocharis*.

Let me know if you would like any additional information to determine if there are any concerns with this species.

Thank you!
Christine

Christine Perron • Senior Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
OFFICE: 603-225-2978 ext. 128
www.mjinc.com

From: Lamb, Amy [<mailto:Amy.Lamb@dred.nh.gov>]
Sent: Tuesday, December 01, 2015 3:56 PM
To: Christine J. Perron
Cc: Tuttle, Kim
Subject: NHB review: NHB15-3706

Attached, please find the review we have completed. If your review memo includes potential impacts to plants or natural communities please contact me for further information. If your project had potential impacts to wildlife, please contact NH Fish and Game at the phone number listed on the review.

Best,
Amy

Amy Lamb
Ecological Information Specialist

NH Natural Heritage Bureau
DRED - Forest & Lands
172 Pembroke Rd
Concord, NH 03301
603-271-2215 ext. 323

NH Fish & Game Correspondence

Christine J. Perron

From: Christine J. Perron
Sent: Tuesday, May 10, 2016 9:50 AM
To: 'Tuttle, Kim'
Subject: RE: Lebanon-Hartford 16148 bridge rehab project RE: NHB review: NHB15-3706

Thank you Kim. Dwarf wedgemussel did not come up in the IPAC report. Since it was in the NHB memo, we did touch base with Susi von Oettingen and she had no concerns since the project is over one mile from the area of DWM concern.

Thanks again,
Christine

From: Tuttle, Kim [mailto:Kim.Tuttle@wildlife.nh.gov]
Sent: Monday, May 09, 2016 10:55 AM
To: Christine J. Perron
Subject: RE: Lebanon-Hartford 16148 bridge rehab project RE: NHB review: NHB15-3706

Hello Christine,

I contacted Chris Martin, NH Audubon, who does eagle work for us regarding the 2 small areas of proposed tree clearing in Vermont. Neither of those two areas shown in the photos is a concern re: eagles. There will be no tree clearing on the NH side of the river for this project. We do not expect impacts to cobblestone tiger beetle on Johnstone Island as a result of the proposed work. Did the USFWS come to some determination regarding dwarf wedgemussel? Did it come up on the IPAC site? I can't recall.

<http://ecos.fws.gov/ipac/>

Regards,

Kim Tuttle
Certified Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Christine J. Perron [mailto:CPerron@mjinc.com]
Sent: Friday, May 06, 2016 10:17 AM
To: Tuttle, Kim
Subject: RE: Lebanon-Hartford 16148 bridge rehab project RE: NHB review: NHB15-3706

Thanks Kim. Very cool to hear there's a new eagle nest.

Based on a quick measurement in GIS, Johnson Island is about a ½ mile downstream from the I-89 bridges.

I look forward to hearing back from you after you discuss with Chris Martin.

From: Tuttle, Kim [mailto:Kim.Tuttle@wildlife.nh.gov]
Sent: Friday, May 06, 2016 10:06 AM

To: Christine J. Perron

Subject: RE: Lebanon-Hartford 16148 bridge rehab project RE: NHB review: NHB15-3706

Thanks Christine-

I'll have Chris Martin evaluate for NHFG. We have a newly-reported eagle nest on Johnson Island in the Connecticut River behind Home Depot in West Lebanon, NH. Site is roughly half-way between known sites in Plainfield NH and Wilder VT, so likely a new territorial pair rather than relocation of previously-known pair. The NHB database has not been updated with this new nest. NHB15-3706 indicated only wintering eagles at that location.

Kim

Kim Tuttle
Certified Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Christine J. Perron [<mailto:CPerron@mjinc.com>]

Sent: Friday, May 06, 2016 9:56 AM

To: Tuttle, Kim

Subject: RE: Lebanon-Hartford 16148 bridge rehab project RE: NHB review: NHB15-3706

An aerial is attached showing the areas of clearing on the VT side. The area further from the river consists of white pine that is less than 12" dbh. The area along the river is mixed hardwoods. Most of these trees are smaller diameter but there may be a few that are over 12" dbh.

From: Tuttle, Kim [<mailto:Kim.Tuttle@wildlife.nh.gov>]

Sent: Friday, May 06, 2016 9:19 AM

To: Christine J. Perron

Subject: RE: Lebanon-Hartford 16148 bridge rehab project RE: NHB review: NHB15-3706

If there will be mature trees taken down on the Vt. side (over 12" d.b.h.), could you send over an aerial showing where?

Thanks,
Kim

From: Christine J. Perron [<mailto:CPerron@mjinc.com>]

Sent: Friday, May 06, 2016 9:17 AM

To: Tuttle, Kim

Subject: RE: Lebanon-Hartford 16148 bridge rehab project RE: NHB review: NHB15-3706

Hi Kim,

Do you have any further concerns with this project?

Thank you,
Christine

From: Christine J. Perron
Sent: Monday, March 14, 2016 10:55 AM
To: 'Tuttle, Kim'
Subject: Lebanon-Hartford 16148 bridge rehab project RE: NHB review: NHB15-3706

Hi Kim,

I have recently learned that there will be no tree clearing on the NH side of the river for this project. There will be two small areas of tree clearing in Vermont. Do you need to see those areas?

Thanks,
Christine

Christine Perron • Senior Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
OFFICE: 603-225-2978 ext. 128
www.mjinc.com

From: Tuttle, Kim [<mailto:Kim.Tuttle@wildlife.nh.gov>]
Sent: Wednesday, December 02, 2015 10:27 AM
To: Christine J. Perron
Subject: RE: NHB review: NHB15-3706

Hi Christine,

I don't need to see the complete report at this time anyway. When you define the limits of clearing, it would be great if you could show that on an aerial so that I can send to the eagle biologist for comment.

Thanks,
Kim

Kim Tuttle
Certified Wildlife Biologist
NH Fish and Game
11 Hazen Drive
Concord, NH 03301
603-271-6544

From: Christine J. Perron [<mailto:CPerron@mjinc.com>]
Sent: Wednesday, December 02, 2015 10:19 AM
To: Tuttle, Kim
Cc: Marc Laurin
Subject: FW: NHB review: NHB15-3706

Hi Kim,

The attached NHB review was an update to one that was requested back in 2013 for the NHDOT Lebanon-Hartford bridge rehabilitation project. Vicki Chase was coordinating the environmental review of this project at that time, and the second PDF that's attached contains the correspondence sent by the two of you.

I'm now working on completing the NEPA document for this project. A description of the proposed action is attached. If you would like to get the complete rehabilitation report, I could send it via our FTP site since it's a large file. Let me know if you would still like to see it.

Final design of the project is just getting underway. Once the proposed limits of clearing have been better defined, I'll get back in touch with you regarding bald eagles.

Thanks,
Christine

Christine Perron • Senior Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
OFFICE: 603-225-2978 ext. 128
www.mjinc.com

From: Lamb, Amy [<mailto:Amy.Lamb@dred.nh.gov>]
Sent: Tuesday, December 01, 2015 3:56 PM
To: Christine J. Perron
Cc: Tuttle, Kim
Subject: NHB review: NHB15-3706

Attached, please find the review we have completed. If your review memo includes potential impacts to plants or natural communities please contact me for further information. If your project had potential impacts to wildlife, please contact NH Fish and Game at the phone number listed on the review.

Best,
Amy

Amy Lamb
Ecological Information Specialist

NH Natural Heritage Bureau
DRED - Forest & Lands
172 Pembroke Rd
Concord, NH 03301
603-271-2215 ext. 323

VT Natural Heritage Correspondence

Vicki Chase - RE: Project review

From: "Popp, Bob" <Bob.Popp@state.vt.us>
To: 'Vicki Chase' <vchase@mjinc.com>
Date: 4/18/2013 12:41 PM
Subject: RE: Project review
CC: "Ferguson, Mark" <mark.ferguson@state.vt.us>

Vicki, the 4766 and 1002 Element codes represent two rare plant species (Siberian chives and Musk flower) that were observed on a rock outcrop about 850 ft. downstream of the bridge. Unless there were to be a direct impact to the outcrop, they should not be affected. Element code 4400 represents an uncommon terrestrial species which would not be impacted by bridge work.

Please let me know if you need additional information. You should also be in contact with Mark Ferguson regarding the presence of mussels in the river if you have not already done so.

Thank you for contacting us.

Bob Popp
 Department Botanist
 VT. Dept of Fish and Wildlife
 Natural Heritage Inventory
 (802) 476-0127

From: Vicki Chase [mailto:vchase@mjinc.com]
Sent: Wednesday, April 17, 2013 11:07 AM
To: Popp, Bob
Subject: Project review

Good Morning,

McFarland Johnson has been retained by the New Hampshire Department of transportation to provide engineering and permitting services for the rehabilitation of the Lebanon-Hartford bridge carrying I-89 over the Connecticut River. To that end, we are requesting a review of the project area to determine if the proposed action would affect any rare plants or significant natural communities.

Attached please find a map of the proposed project area with Natural Heritage data from VCGI. Bridge rehabilitation plans are not yet available.

Thanks for your help.

Vicki Chase • Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
Office: 603-225-2978 •
www.mjinc.com

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USFWS Official Species List



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:
Consultation Code: 05E1NE00-2016-SLI-0320
Event Code: 05E1NE00-2018-E-05839
Project Name: Lebanon, NH - Hartford, VT 16148

July 24, 2018

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2016-SLI-0320

Event Code: 05E1NE00-2018-E-05839

Project Name: Lebanon, NH - Hartford, VT 16148

Project Type: TRANSPORTATION

Project Description: Rehabilitation and widening of the two bridges that carry Interstate 89 over the Connecticut River between Lebanon, NH and Hartford, VT.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/43.63456862960728N72.32948012413948W>



Counties: Grafton, NH | Windsor, VT

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS Correspondence (Dwarf Wedgemussel)

Christine J. Perron

From: vonOettingen, Susi <susi_vonoettingen@fws.gov>
Sent: Tuesday, February 21, 2017 8:45 AM
To: Christine J. Perron
Subject: Re: NHDOT Project - Lebanon-Hartford 1648 - Dwarf wedgemussel

Hi Christine,

No, still no problem. We have not found any DWM in that area and the most recent confirmation is miles down river.

Susi

Susi von Oettingen
Endangered Species Biologist
New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301
(W) 603-223-2541 ext. 6418

www.fws.gov/newengland

On Fri, Feb 17, 2017 at 2:23 PM, Christine J. Perron <CPerron@mjinc.com> wrote:

Susi,

I am completing permit applications for the subject project. I recently updated our Natural Heritage Bureau database search, which shows this area of the Connecticut River as flagged for DWM (second attachment). We contacted you back in 2013 about this project (first attachment) and you didn't have concerns since the nearest DWM population is over a mile downstream. I wanted to check in with you to make sure that this is still the case.

Thanks,

Christine

Christine Perron, CWS • Senior Environmental Analyst

McFarland Johnson

Vicki Chase - Re: NHB13-1182 dwarf wedge mussel Connecticut River

From: "vonOettingen, Susi" <susi_vonoettingen@fws.gov>
To: Vicki Chase <vchase@mjinc.com>
Date: 4/18/2013 10:45 AM
Subject: Re: NHB13-1182 dwarf wedge mussel Connecticut River

Hi Vicki,

Thanks for the email. Yes, the NHB had a hit, but the closest DWM location is at the mouth of the Ottaquechee River. We buffered our site maps and including the buffer, the bridge is still over one mile from the area of DWM concern.

This shouldn't be an issue at all if proper erosion controls are in place.

Susi

On Thu, Apr 18, 2013 at 9:39 AM, Vicki Chase <vchase@mjinc.com> wrote:

Good morning Susi,

McFarland Johnson has been contracted by the NHDOT to provide engineering and permitting services for the rehabilitation of the bridge carrying I-89 over the Connecticut River in Lebanon, NH and Hartford, VT. A data request submitted to the New Hampshire Natural Heritage Bureau yielded a record for the dwarf wedge mussel (*Alasmidonta heterodon*) in the Connecticut River. We do not yet have design plans for your review, but I wanted to alert you to the project and check to see if you had any preliminary response or requests. Attached is the NHB response we received.

Thanks for your help.

Vicki Chase • Environmental Analyst
McFarland Johnson
53 Regional Drive • Concord, NH 03301
Office: 603-225-2978 •
www.mjinc.com

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Susi von Oettingen

USFWS Project Submittal Form (Northern Long-Eared Bat)

Federal Highway Administration (FHWA), Federal Railroad
Administration (FRA), and Federal Transit Administration (FTA)

Range-wide Programmatic Consultation for
Indiana Bat and Northern Long-eared Bat

Project Submittal Form

Updated May 2016

In order to use the range-wide programmatic consultation to fulfill Endangered Species Act consultation requirements, transportation agencies must use this submittal form (or a comparable Service approved form) to provide project-level information for all actions that may affect the Indiana bat and/or northern long-eared bat (NLEB). The completed form should be submitted to the appropriate U.S. Fish and Wildlife Service (Service) Field Office prior to project commencement. For more information, see the Standard Operating Procedure for Site Specific Project(s) Submission in the User's Guide.

By submitting this form, the transportation agency ensures that the proposed project(s) adhere to the criteria and conditions of the range-wide programmatic consultation, as outlined in the biological assessment (BA) and biological opinion (BO). Upon submittal of this form, the appropriate Service Field Office may review the project-specific information provided and request additional information. For projects that may affect, but are not likely to adversely affect (NLAA) the Indiana bat and/or NLEB, if the applying transportation agency is **not** contacted by the Service with any questions or concerns within 14 calendar days of form submittal, it may proceed under the range-wide programmatic consultation and assume concurrence of the NLAA determination made by the Service in the BO. For projects that may affect, and are likely to adversely affect (LAA) the Indiana bat and/or the NLEB, the appropriate Service Field Office will respond (see recommended response letter template) within 30 calendar days of receiving a complete project-level submission, which includes, but may not be limited to this completed form.

Further instructions on completing the submittal form can be found by hovering your cursor over each text box.

1. Date: **November 1, 2016**

2. Lead agency: **FHWA**

This refers to the Federal governmental lead action agency initiating consultation; select FHWA, FRA or FTA as appropriate

3. Requesting agency: **NHDOT**

This refers to the transportation agency completing the form (it may or may not be the same as the Lead Agency).

• Name: **Marc Laurin**

• Title: **Senior Environmental Manager**

- Phone: (603) 271-3226
- Email: mlaurin@dot.nh.gov

4. Consultation code¹: 05E1NE00-2016-SLI-0320

5. Project name(s): Lebanon, NH - Hartford, VT 16148

6. Project description:

Please attach additional documentation or explanatory text if necessary

The New Hampshire Department of Transportation (NHDOT) proposes to rehabilitate and widen the northbound and southbound Interstate 89 (I-89) bridges crossing the Connecticut River from Lebanon, NH to Hartford, VT. The proposed project will consist of a bridge in-fill that will close the gap between the two existing bridges. New piers will be required that will be constructed between the existing piers. A new superstructure will entirely replace the existing decks, structural steel, and bearings. The bridge and approaches will carry a total of six (6) lanes of traffic, two through lanes in each direction and auxiliary lanes between Exit 20 in New Hampshire and the Interstate 91 Interchange in Vermont. Scour protection will be placed around three of the four piers. Traffic control for the project will consist of a phased construction process utilizing temporary median crossovers.

Stormwater treatment areas will be constructed as part of this project. A wet detention basin is proposed on the Vermont side to collect and treat 

7. Project location (county, state):

If not delineated in IPaC, attach shape files

8. For other species from IPaC official species list:

- ✓ No effect – project(s) are inside the range, but no suitable habitat (see additional information attached).

May affect – see additional information provided for those species (see attached or forthcoming).

Please confirm and identify how the proposed project(s) adhere to the criteria of the BO by completing the following (see User Guide Section 2.0):

¹ Available through IPaC System Official Species List: <https://ecos.fws.gov/ipac/>

NO EFFECT

9. For Indiana bat/NLEB, if applicable, select your no effect determination:

No effect – project(s) are outside the species' range. *submittal form complete*

No effect – project(s) are inside the species range but no suitable forested bat habitat; must also be greater than 0.5 miles from any hibernaculum. *submittal form complete*

No effect – project(s) do not involve any construction activities (e.g., bridge assessments, property inspections, planning and technical studies, property sales, property easements, and equipment purchases). *submittal form complete*

No effect – project(s) are completely within existing road/rail surface and do not involve percussive or other activities that increase noise above existing traffic/background levels (e.g., road line painting). *submittal form complete*

No effect – project(s) includes maintenance, alteration, or demolition of bridge(s)/structure(s) and indicate(s) no signs of bats from results of a bridge/structure assessment. *submittal form complete*

Otherwise, please continue below.

MAY AFFECT, NOT LIKELY TO ADVERSELY EFFECT – W/O AMMS

10. For Indiana bat/NLEB, if applicable, select your may affect, NLAA determination (without implementation of AMMs):

NLAA – project(s) are inside the range and suitable bat habitat is present, but **negative** bat presence/absence (P/A) surveys; must also be greater than 0.5 miles from any hibernaculum. *submittal form complete*

NLAA – project(s) within suitable bat habitat that involve maintenance of existing facilities (e.g., rest areas, stormwater detention basins) but do not remove or alter the habitat (e.g., mowing, brush removal). *submittal form complete*

NLAA – project(s) within 300 feet of existing road/rail surfaces in areas that contain suitable habitat but do not remove or alter the habitat (e.g., mowing, brush removal). *submittal form complete*

NLAA – project(s) limited to slash pile burning. *submittal form complete*

NLAA – project(s) are limited to wetland or stream protection activities associated with compensatory wetland mitigation that do not clear suitable habitat. *submittal form complete*

Otherwise, please continue below.

MAY EFFECT, NOT LIKELY TO ADVERSELY AFFECT – WITH AMMs

11. For Indiana bat/NLEB, if applicable, document your may affect, NLAA determination by completing the following section (**with implementation of AMMs**; use #13 to document AMMs).

Affected Resource/Habitat Type:

a. Trees

Verify that all tree removal occurs greater than 0.5 mile from any hibernaculum: ✓

Verify that the project is within 100 feet of existing road/rail surfaces: ✓

Verify that no documented Indiana bat and/or NLEB roosts and/or surrounding summer habitat within 0.25 mile of documented roosts will be impacted: ☒

Verify that all tree removal will occur outside the active season (i.e., will occur in winter)²: All tree removal will occur between 9/1 and 4/14.

Acres of trees proposed for removal: Approx. 1 acre

b. Bridge/Structure Work Projects

Proposed work: Bridge rehabilitation and widening

Timing of work: Multiple years

Evidence of bat activity on/in bridge/structure? Y/N N

Verify that work will be conducted outside the active season, or if during the active season, verify that no roosting bats will be harmed or disturbed in any way: ✓

Verify that work will not alter roosting potential in any way:

Verify that all applicable lighting minimization measures will be implemented: ☒

c. Other (please explain)

² Coordinate with the local Service Field Office for appropriate dates.

MAY AFFECT, LIKELY TO ADVERSELY AFFECT

12. For Indiana bat/NLEB, if applicable, document your may affect, LAA determination by completing the following section (use #13 to document AMMs).

Affected Resource/Habitat Type:

a. Trees

Verify that all tree removal occurs greater than 0.5 mile from any hibernaculum: ☐

Project Location:

0-100 feet from edge of existing road/rail surface ☐

100-300 feet from edge of existing road/rail surface ☐

Verify that no documented Indiana bat roosts or surrounding summer habitat within 0.25 mile of documented roosts will be impacted between May 1 and July 31: ☐

Verify that no documented NLEB roosts or surrounding summer habitat within 150 feet of documented roosts will be impacted between June 1 and July 31: ☐

Timing of tree removal:

Acres of trees proposed for removal:

b. Bridge/Structure Work Projects

Proposed work:

Timing of work:

Verify no signs of a colony: ☐

Verify that work will not alter roosting potential in any way: ☐

13. For Indiana bat/NLEB, **if applicable to the action type**, the following AMMs will be implemented³ unless P/A surveys and/or bridge assessments document that the species are not likely to be present:

General AMM 1(required for all projects):

³ See AMMs Fact Sheet (Appendix C) for more information on AMMs

Tree Removal AMM 1: ☒
Tree Removal AMM 2 (required for NLAA): ☒
Tree Removal AMM 3 (required for all projects): ☒
Tree Removal AMM 4 (required for NLAA): ☒
Tree Removal AMM 5 (required for LAA): ☐
Tree Removal AMM 6 (required for LAA): ☐

Tree Removal AMM 7 (required for LAA):

Bridge AMM 1: ☐
Bridge AMM 2 (required for all projects during active season): ☒
Bridge AMM 3 (required for NLAA during active season): ☒
Bridge AMM 4 (required for NLAA during active season): ☒
Bridge AMM 5 (required for all projects): ☒

Structure AMM 1 (required for all Indiana bat projects, required for NLAA NLEB projects): ☐
Structure AMM 2 (required for all Indiana bat projects, required for NLAA NLEB projects): ☐
Structure AMM 3 (required for all Indiana bat projects, required for NLAA NLEB projects): ☐
Structure AMM 4 (required for all Indiana bat projects, required for NLAA NLEB projects): ☐

Lighting AMM 1 (required for all projects during the active season): ☒
Lighting AMM 2 (required for all projects): ☒

Hibernacula AMM 1 (required for all projects): ☒

14. For Indiana bat, if applicable, compensatory mitigation measures will also be required to offset adverse effects on the species (see Section 2.10 of the BA). Please verify the mechanism in which compensatory mitigation will be implemented and that sufficient information is provided to the Service.

Range-wide In Lieu Fee Program, The Conservation Fund ☐

State, Regional, Recovery Unit-Specific In Lieu Fee Program
Name:

Conservation Bank,
Name:
Location:

Local Conservation Site(s)
Name:
Location:
Description:

Bridge/Structure Assessment Form

This form will be completed and submitted to the District Environmental Manager by the Contractor prior to conducting any work below the deck surface either from the underside, from activities above that bore down to the underside, or that could impact expansion joints, from deck removal on bridges, or from structure demolish. Each bridge/structure to be worked on must have a current bridge inspection. Any bridge/structure suspected of providing habitat for any species of bat will be removed from work schedules until such time that the DOT has obtained clearance from the US Fish and Wildlife Service, if required. Additional studies may be undertaken by the DOT to determine what species may be utilizing structures prior to allowing any work to proceed.

DOT Project # 16148	Water Body Connecticut River	Date/Time of Inspection October 8, 2015
-------------------------------	--	---

Route:	County:	Federal Structure ID:	Bat Indicators Check all that apply. Presence of one or more indicators is sufficient evidence that bats may be using the structure.				Notes: (e.g., number & species of bats, if known. Include the results of thermal, emergent, or presence/absence summer survey)
			Visual	Sound	Droppings	Staining	
I-89	Grafton	044/104 044/103					No indicators found; bridge primarily surveyed with binoculars

Areas Inspected (Check all that apply)

Bridges		Culverts/Other Structures			Summary Info (circle all that apply)			
All vertical crevices sealed at the top and 0.5-1.25" wide & 24" deep					Human disturbance or traffic under bridge/in culvert or at the structure	Flight Traffic	Low	None
		X	Crevices, rough surfaces or imperfections in concrete					

All crevices >12" deep & not sealed	X	Spaces between walls, ceiling joists		Possible corridors for netting	None/poor	Marginal	Excellent
All guardrails	X			Evidence of bats using bird nests, if present?	Yes	No	
All expansion joints	X						
Spaces between concrete end walls and the bridge deck	X						
Vertical surfaces on concrete I-beams	X						

Assessment Conducted By: Christine Perron, McFarland Johnson Signature(s): 

District Environmental Use Only: Date Received by District Environmental Manager: _____

DOT Bat Assessment Form Instructions

1. Assessments must be completed a minimum of 1 year prior to conducting any work below the deck surface on all bridges that meet the physical characteristics described in the Programmatic Consultation, regardless of whether assessments have been conducted in the past. **Due to the transitory nature of bat use, a negative result in one year does not guarantee that bats will not use that structure in subsequent years.**
2. Any bridge/structure suspected of providing habitat for any species of bat will be removed from work schedules until such time that the DOT has obtained clearance from the USFWS, if required. Additional studies may be undertaken by the DOT to determine what species may be utilizing each structure identified as supporting bats prior to allowing any work to proceed.
3. Estimates of numbers of bats observed should be placed in the Notes column.
4. Any questions should be directed to the District Environmental Manager.

Section 106 Effect memo



Victoria F. Sheehan
Commissioner

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION



William Cass, P.E.
Assistant Commissioner

Lebanon, NH – Hartford, VT
A001(154)
16148
RPR 4493

No Historic Properties Affected Memo

Pursuant to the Request for Project Review signed by the NH Division of Historical Resources (NHDHR) on January 24, 2013, and for the purpose of compliance with regulations of the National Historic Preservation Act and the Advisory Council on Historic Preservation's *Procedures for the Protection of Historic Properties* (36 CFR 800), the NH Division of the Federal Highway Administration (FHWA), the NH Department of Transportation (NHDOT), the Vermont Agency of Transportation (VAOT), and the NHDHR have coordinated the identification and evaluation of historical and archaeological resources with plans to rehabilitate and widen the north and south bound bridges that carry I-89 over the Connecticut River between Lebanon, New Hampshire and Hartford, Vermont. The Vermont Agency of Transportation (VTrans) has reviewed this project according to the standards and procedures detailed in the 2000 Programmatic Agreement (PA) regarding Implementation of the Federal Highway Administration's (FHWA) Federal-Aid Highway Program in Vermont and the corresponding Manual of Standards and Guidelines (Manual).

Project Description

The project consists of the rehabilitation of the Interstate 89 bridges that span the Connecticut River and New England Central Railroad between Lebanon, NH and Hartford, VT (Bridges 044/103 and 044/104). The existing superstructure steel will be replaced with new steel and an in-fill will be constructed in the gap between the bridges to provide a single 110' +/- wide bridge deck. The in-fill will require new footings between each of the five pairs of existing piers. The resulting bridge will provide two through lanes in each direction and auxiliary lanes between Exit 20 and the I-91 ramps in both directions, and will require realignment of I-89 on both approaches. The project will also include the installation of scour protection around three of the five piers and construction of stormwater treatment areas on both sides of the river. The Area of Potential Effect (APE) includes the existing right-of-way in New Hampshire and Vermont, as well as an area along the railroad adjacent to the bridges to accommodate construction access.

Analysis

Based on a review pursuant to 36 CFR 800.4 of the architectural and/or archaeological significance of resources in the APE, we agree that there are no above ground or below ground resources within the APE. The bridges carrying the interstate are exempt from Section 106 Review by Agreement with the Advisory Council on Historic Preservation and the FHWA, under the 2005 Exemption Regarding Historic Preservation Review Process for Effects to the Interstate Highway System. Further, a 1994 Phase IA Archaeological Assessment was completed for the NH quadrants and determined that there was no sensitivity within this projects APE. A Phase IB Archaeological Reconnaissance Survey was completed on the northeast quadrant in VT in 2016. The VAOT Archaeology Officer reviewed the report and determined that no additional subsurface testing was necessary.

Public Consultation

A Public Informational Meeting was held on July 24, 2014 in West Lebanon, New Hampshire and a Public Officials Meeting was held on July 16, 2014 at the Lebanon City Council Meeting. Outreach letters were sent to local historical societies, the New Hampshire Preservation Alliance, the Connecticut River Joint Commissions, and local conservation commissions. No Consulting Parties were identified.

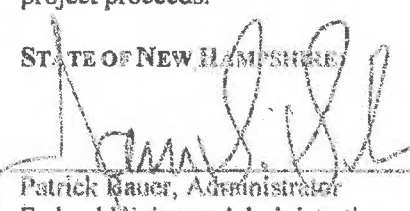
Determination of Effect

Based on a review pursuant to 36 CFR 800.4, we agree that no historic or archaeological resources are affected in the project area and that no further survey work is needed.

Section 4(f) to be completed by FHWA	There Will Be:	<input checked="" type="checkbox"/> No 4(f);	<input type="checkbox"/> Programmatic 4(f);	<input type="checkbox"/> Full 4 (f); or
	<input type="checkbox"/> A finding of <i>de minimis</i> 4(f) impact as stated: In addition, with NHDHR concurrence of no adverse effect for the above undertaking, and in accordance with 23 CFR 774.3, FHWA intends to, and by signature below, does make a finding of <i>de minimis</i> impact. NHDHR's signature represents concurrence with both the no adverse effect determination and the <i>de minimis</i> findings. Parties to the Section 106 process have been consulted and their concerns have been taken into account. Therefore, the requirements of Section 4(f) have been satisfied.			


In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

STATE OF NEW HAMPSHIRE


Patrick Bauer, Administrator
Federal Highway Administration

1/19/17
Date

STATE OF VERMONT:


Jeannine Russell-Pinkham
Archaeology Officer
VT Agency of Transportation

Date


Judith Ehrlich
Historic Preservation Officer
VT Agency of Transportation

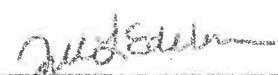
1/19/2017

Date

Concurred with by:


Elizabeth H. Muzzey
State Historic Preservation Officer
NH Division of Historical Resources

1-23-17
Date


Jillian Edelmann
Cultural Resources Manager
NH Department of Transportation

1/17/2017

Date

c.c. Chris St. Louis, NHDHR Christine Perron, McFarland-Johnson
 Jamie Sikora, FHWA Marc Laurin, NHDOT
 Lee Goldstein, VAOT

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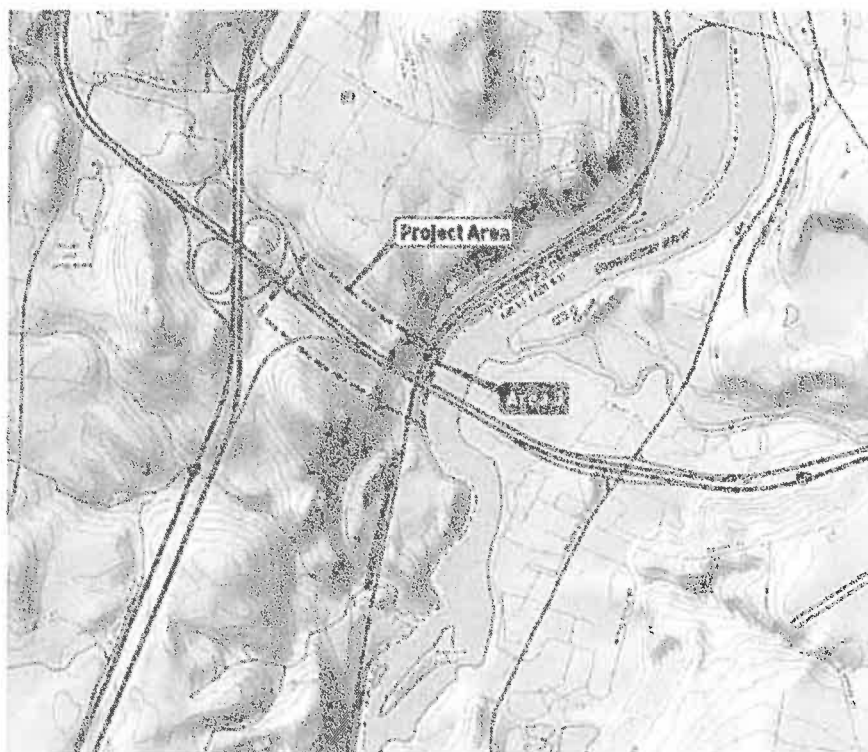


Figure 1: Illustrating the general project location, project area on the Vermont side (in red) and area tested for archaeology (in blue) From Hartgen report 10-16-16.

Army Corps Secondary Impacts Checklist (Appendix B)



**US Army Corps
of Engineers**
New England District

**New Hampshire General Permits (GPs)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)**

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to "work" include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*	X	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?	X	
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/ . The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	5,600 sq ft	
2.7 What is the area of the proposed fill in wetlands?	24,013 sq ft	
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?	22%	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index	X	

3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”) Map information can be found at: <ul style="list-style-type: none"> • PDF: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 		X
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 21?	X	
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?	X	
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.

** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

**NH Department of Transportation
Lebanon-Hartford, 16148**

ACOE Appendix B Supplemental Narrative

1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water?

The portion of the Connecticut River that flows through the City of Lebanon is listed on the NHDES 2016 Draft State 303(d) List for *E. coli* contamination from combined sewer overflows. Vermont's 2012 List of Priority Surface Waters identifies this portion of the river as impaired for aquatic life support by flow alteration caused by fluctuating flows associated with hydropower production from the Wilder Dam upstream.

Stormwater runoff from most of the proposed new pavement as well as areas of existing pavement will be treated by permanent stormwater best management practices (BMPs). Work as proposed will result in a net increase in impervious surface of approximately 0.5 acres in Vermont. An infiltration basin proposed in Vermont will collect and treat runoff from approximately 2.04 acres of pavement. This basin will be constructed per VT Agency of Natural Resources requirements. On the New Hampshire side, there will be an increase of approximately 0.9 acres of impervious surface. The proposed treatment swale and infiltration basin will treat runoff from approximately 2.82 acres of pavement. For the overall project, there would be approximately 4.86 acres of pavement treated, compared with an increase of 1.4 acres of new impervious surface.

3.1 Has the NHB determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project?

The NH Natural Heritage Bureau and VT Natural Heritage Inventory identified the following occurrences of species in the vicinity of the project:

- Cobblestone tiger beetle (*Cicindela marginipennis*) (NH State endangered)
- Dwarf wedge mussel (*Alasmidonta heterodon*) (NH State and federally endangered)
- Mudflat spikesedge (*Eleocharis intermedia*) (NH State endangered)
- Bald eagle (*Haliaeetus leucocephalus*) (NH State threatened and VT State endangered)
- Siberian chives (*Allium schoenoprasum*) (VT State threatened)
- Musk flower (*Mimulus moschatus*) (VT tracked)
- Obedient false dragonhead (*Physostegia virginiana*) (VT State threatened)

The USFWS Information, Planning, and Conservation System (IPaC) web tool was utilized to determine if federally listed species have the potential to occur in the project area. According to IPaC, the federally-threatened northern long-eared bat is a potential concern in this region.

Coordination with the appropriate State and Federal agencies has resulted in the following determinations:

Cobblestone tiger beetle: NH Fish and Game has no concerns with this species.

Dwarf wedge mussel: The USFWS indicated that records for dwarf wedge mussel are over a mile away from the project and there were no further concerns about this species.

Mudflat spikesedge: The New Hampshire Natural Heritage Bureau indicated that appropriate habitat in the vicinity of the project should be surveyed for *Eleocharis intermedia* prior to construction. This survey was completed on October 8, 2015 and found that the NH side of the river through the project area is a rocky shoreline, with rocks extending into the water and dense vegetation located just above the rocks and, in some areas, extending almost to the edge of water. There were no mud flats in this area. The most common species were knotweed, reed canary grass, and purple loosestrife. There are areas of exposed mud flat habitat along the VT shoreline but there was no evidence of *Eleocharis* species. The NHB has no further concerns with this species.

Bald eagle: NH Fish and Game reviewed the areas of proposed tree clearing and had no concerns regarding bald eagles.

Siberian chives, musk flower, obedient false dragonhead: Vermont Natural Heritage Inventory noted that these plants occurred on a rock outcrop approximately 500 feet downstream of the project. Since this outcrop will not be impacted by the project, there are no further concerns regarding these species.

Northern long-eared bat: The NH Natural Heritage Bureau, State of Vermont Natural Heritage Inventory, and NH Fish & Game have no known records of winter hibernacula or maternity roost trees in the vicinity of the project. No evidence of bat sign has been observed on the bridge to date. Since the project is not scheduled for construction for several years, the bridge will need to be reviewed again for bat sign prior to construction activities taking place on the bridge. There will be areas of tree clearing associated with construction access along the river and the construction of the detention pond in Vermont. All clearing can be done during the non-active season for bats.

The project adheres to the criteria of the FHWA and FRA *Range-Wide Programmatic Informal Biological Assessment for Transportation Projects for Indiana Bat and Northern Long-Eared Bat* as new road/bridge construction. All applicable tree removal and bridge Avoidance and Minimization Measures will be implemented, including completing tree removal during the non-active season for bats (September 1 – April 14) and inspecting the bridge for bat sign prior to the start of construction activities. For these reasons, the project results in a determination of May Effect, Not Likely to Adversely Affect for the northern long-eared bat. A Project Submittal Form has been submitted to the USFWS.

4.2 Will compensatory flood storage be provided if the project results in a loss of flood storage?

Due to the proposed scour protection and the in-fill between the existing piers, the work as proposed will result in an increase in base flood elevation of 0.04 feet (0.5"). To compensate for the increase in flood elevation that will result from the pier in-fills and scour protection, the Vermont bank will be cut back in order to widen the capacity of the river during flood events and create a zero increase in flood elevation. This will entail benching into the river bank to create a narrow shelf, staying approximately one foot above ordinary high water. The bank cut is also expected to benefit wildlife traversing the steep river bank under the bridges. To achieve a zero increase in flood elevation, the bank will be benched approximately 388 linear feet.

5. For a minor or major project, a copy of the RPR shall be sent to the NH Division of Historical Resources.

The NH Department of Transportation has coordinated with the Vermont Agency of Transportation Historic Preservation Officer (VTrans HPO), VTrans Archaeology Officer, NH State Historic Preservation Office (NH SHPO), and the Federal Highway Administration (FHWA), to locate and identify properties listed in or eligible for the National Register of Historic Places within the project area. Effects on cultural resources were determined based on the Section 106 review process established by the National Historic Preservation Act. It has been determined that the Proposed Action would result in No Historic Properties Affected.

Photographs

**Interstate 89
Lebanon, NH – Hartford, VT 16148**



Photo 1: Downstream face of bridge (7/7/2016)
Impact locations visible in photo include P, J, I, G, H, E, F, D, K, L, O, M

**Interstate 89
Lebanon, NH – Hartford, VT 16148**



Photo 2: Downstream face of bridge with NH bank on the right (5/30/2011)
Impact locations visible in photo include P, G, E, F, D, K, L, B, C, A

**Interstate 89
Lebanon, NH – Hartford, VT 16148**

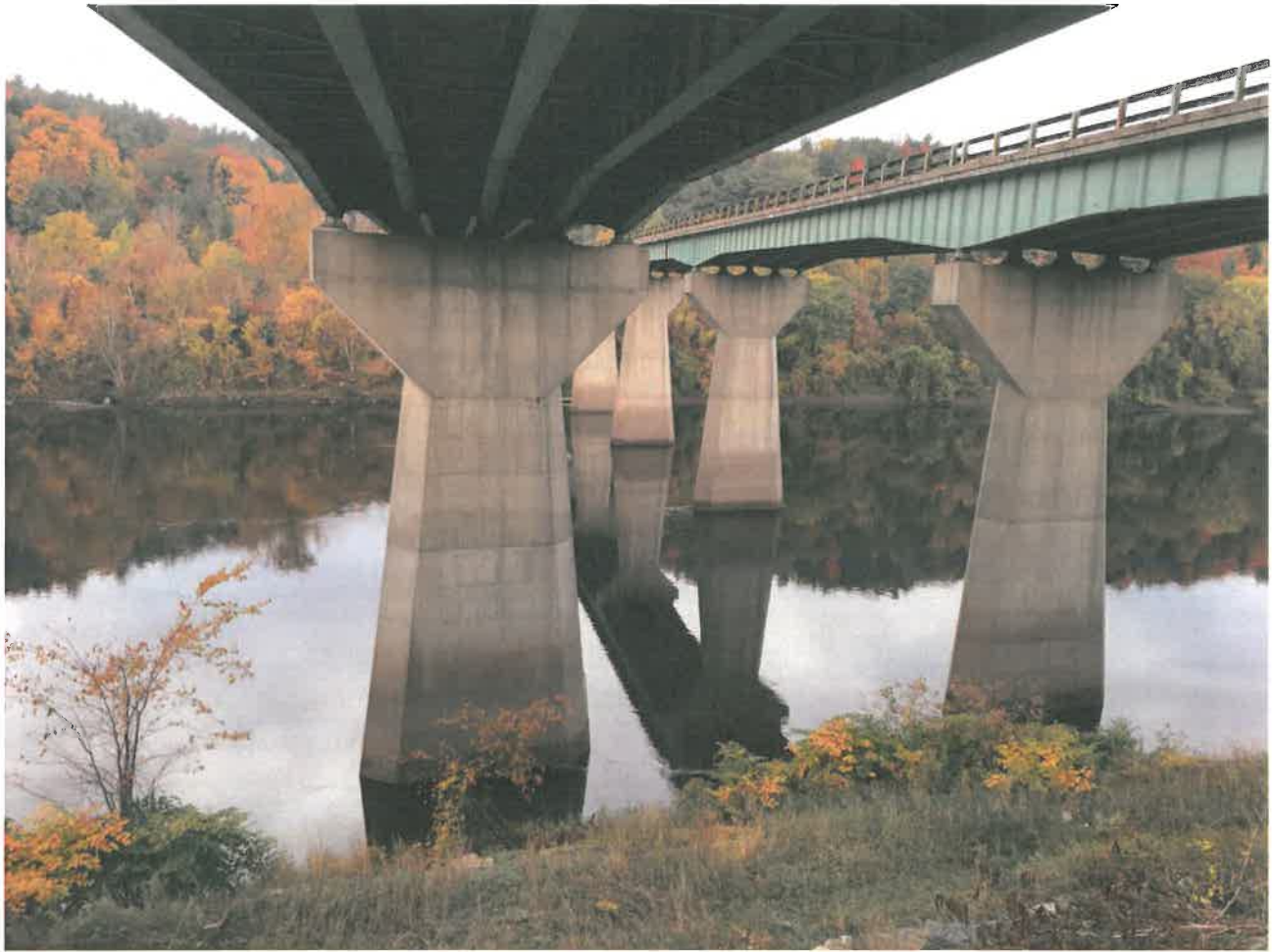


Photo 3: View across river from NH bank (10/13/2015)
Impact locations visible in photo include K, L, D, E, F, B, C, P

**Interstate 89
Lebanon, NH – Hartford, VT 16148**



Photo 4: NH bank (7/7/2016) – Impact locations visible in photo include K, L, D, F

**Interstate 89
Lebanon, NH – Hartford, VT 16148**

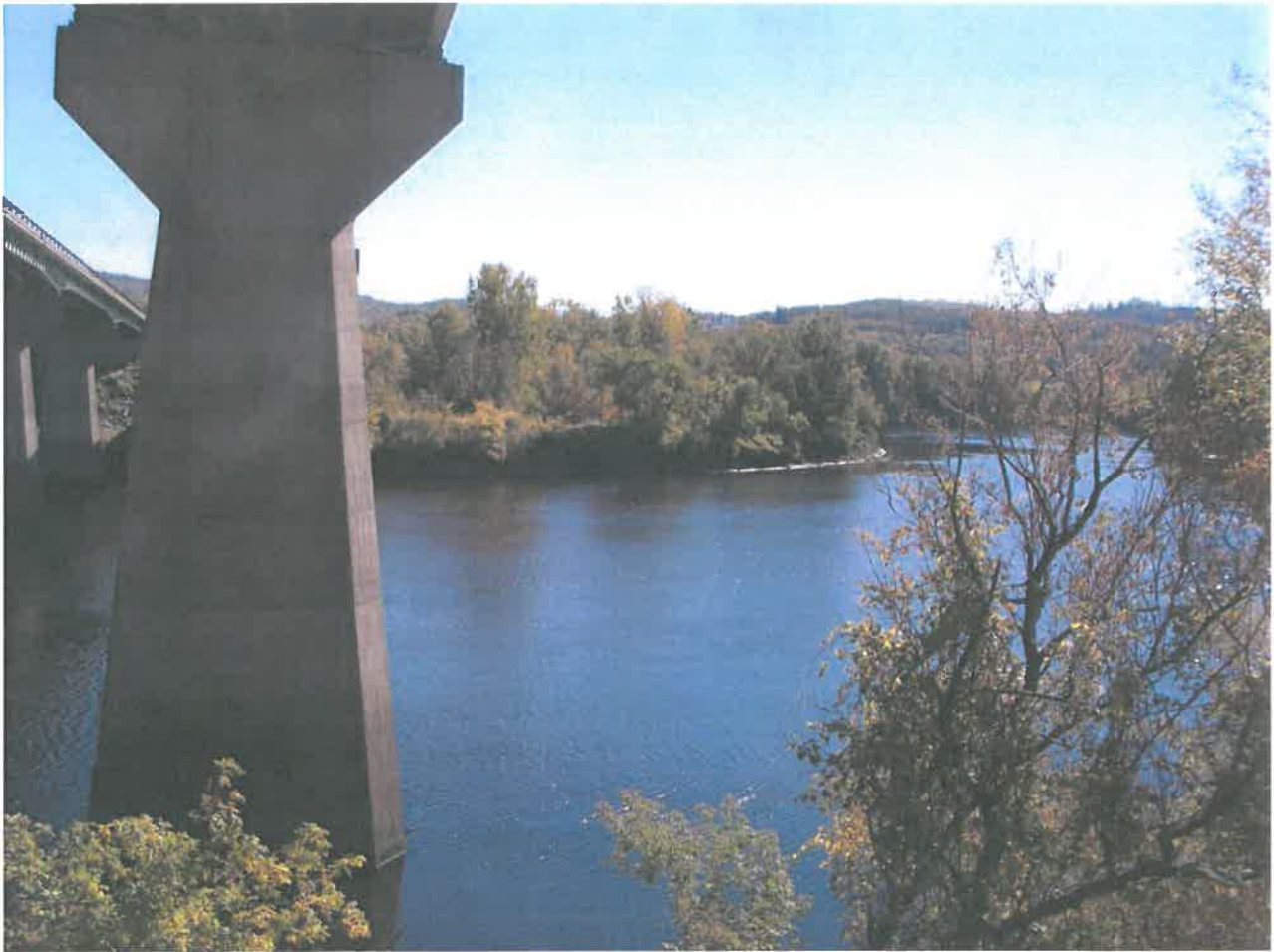


Photo 5: View across river toward southeast quadrant in NH (10/8/2015)
Impact locations visible in photo include A, B, C

**Interstate 89
Lebanon, NH – Hartford, VT 16148**



Photo 6: Downstream face of bridge with view of access trail under bridge on NH side (5/30/2011)
Impact locations visible in photo include K, L, D, B, C

**Interstate 89
Lebanon, NH – Hartford, VT 16148**



Photo 7: NH bank in northeast quadrant (10/8/2015) – Impact location N

Interstate 89
Lebanon, NH – Hartford, VT 16148



Photo 8: Downstream face of bridge with view of VT bank and railroad (5/21/2011)
Impact locations visible in photo include J, Q, I, G

**Interstate 89
Lebanon, NH – Hartford, VT 16148**



Photo 9: VT bank and railroad facing upstream (10/13/2015)
Impact locations visible in photo include P, Q

**Interstate 89
Lebanon, NH – Hartford, VT 16148**



Photo 10: Under bridge facing upstream along VT bank (10/8/2015) – Impact location Q

Construction Sequence

**NH Department of Transportation
Lebanon-Hartford, 16148**

Construction Sequence

Season 1 – Construct Temporary work trestles, median roadway widening, and abutment infills.

- Install perimeter controls around trestle bulkhead areas and Pier 1 work area.
- Install trestle bulkheads and Pier 1 work area.
- Install trestle

- Install Perimeter controls along Vermont river bank.
- Rework Vermont slope between the railroad tracks and the river.
- Construct Abutment Infills

- Install perimeter controls along toe of slope in New Hampshire
- Install EPSC measures (i.e Dandy Bags) at catch basins in median.
- Construct temporary sediment basins between toe of slope and right-of-way line along both barrels of the Interstate, presumably in the location of the permanent treatment swale and infiltration basin, while leave sufficient room for contractor access to the work area.
- Construct roadway widening in the median.

Season 2 – Construct bridge infill including piers, structural steel, and deck. Once completed, shift southbound traffic to the newly completed middle of bridge.

- Maintain all EPSC measures placed in Season 1
- Install perimeter controls around Piers, 2, 3, and 4 work zones.
- Construct pier infills.
- Remove perimeter controls around Piers, 2, 3, and 4 work zones.
- Place structural steel for new deck area.
- Construct new deck area.
- Once new deck area is completed, shift southbound traffic to newly completed middle of bridge.

Season 3 – Reconstruct southbound bridge including abutment and pier modifications, structural steel replacement, and deck. Once completed, reconstruct roadway approaches to shift southbound traffic onto the new southbound portion of the bridge and shift northbound traffic to the middle of the bridge.

- Maintain all EPSC measures placed in Season 1.
- Remove existing deck and structural steel for southbound bridge.
- Place structural steel for new southbound bridge.
- Construct new southbound bridge deck area.
- Construct roadway approaches to southbound bridge.
- Once new deck area is completed, shift southbound traffic to new southbound bridge.
- Reconstruct median area to allow northbound traffic to be placed on middle of the bridge.
- Shift northbound traffic to newly completed middle of bridge.

Season 4 - Reconstruct northbound bridge including abutment and pier modifications, structural steel replacement, and deck. Once completed, reconstruct roadway approaches to shift northbound traffic onto the new northbound portion of the bridge. Reconfigure the center of the bridge and install median barrier. Reconstruct the roadway approach to the final lane configuration.

- Maintain all EPSC measures placed in Season 1.
- Remove existing deck and structural steel for northbound bridge.
- Place structural steel for new northbound bridge.
- Construct new northbound bridge deck area.
- Construct roadway approaches to northbound bridge.
- Once new deck area is completed, shift northbound traffic to new northbound bridge.
- Reconstruct median area for final condition.

Season 5 – Remove the temporary work trestles.

- Finalize median reconstruction for final condition.
- Place traffic in final configuration.
- Remove perimeter controls along Vermont river bank.
- Place A-Jacks scour countermeasures at Piers 2 and 3.
- Remove the temporary work trestle.
- Remove work trestle bulkheads and Pier 1 work platform.
- Remove perimeter controls around work trestle bulkheads and Pier 1 work platform.
- Construct vegetated treatment swale and infiltration basin.

Criteria for Shoreline Stabilization (404 Rules)

PART Env-Wt 404 CRITERIA FOR SHORELINE STABILIZATION

There are two areas of proposed permanent bank impact that will involve shoreline stabilization.

A new pipe will be installed to outlet a proposed infiltration basin and the pipe will outlet just north of the bridge at the top of bank (see impact location N on impact plans). A stone apron will be installed at the outlet to prevent scour between the pipe and ordinary high water, impacting approximately 44 square feet of bank (14 linear feet).

A proposed treatment swale will be located along the toe of slope to the south of the I-89 southbound barrel and will outlet just south of the bridge. The river bank will be lowered at the swale's outlet to allow for proper drainage of the swale, resulting in 579 square feet (45 linear feet) of impact to the bank (see impact location A on impact plans). The swale will be vegetated up to the ordinary high water line.

Env-Wt 404.01 Least Intrusive Method. Shoreline stabilization shall be by the least intrusive but practical method.

Given the high velocity of water that will be discharged from the pipe, stone is the most practical method of stabilizing the bank at the pipe's outlet.

Runoff from the swale will discharge into the river at a low velocity due to the vegetated, flat slope of the swale. Therefore, vegetation is the most practical method of stabilizing the bank within the swale.

Env-Wt 404.02 Diversion of Water. Diversion of stormwater run-off often provides effective and low maintenance erosion protection, and shall be used to the maximum extent practical.

Outletting the pipe and swale at the river is proposed in order to keep work within existing right-of-way and to avoid future erosion along the steep roadway slopes and the access road under the bridge.

Env-Wt 404.03 Vegetative Stabilization.

- (a) Natural vegetation shall be left intact to the maximum extent possible. If space and soil conditions allow, unstable banks shall be cut back to a flatter slope, seeded, and replanted with native, non-invasive trees and shrubs.

Vegetation along the river bank will be cleared only to the extent needed for construction and access. Except in the area of the proposed stone apron at the pipe outlet, disturbed areas will be seeded upon completion of construction activities and natural vegetation will regenerate over time.

- (b) If space relative to the highest observable tide line, water turbulence, and soil conditions allow, the project shall include vegetation of existing sand beach or dunes or construction of vegetated sand dunes.

N/A

Env-Wt 404.04 Rip-rap.

(a) Rip-rap applications shall be considered only where the applicant demonstrates that anticipated turbulence, flows, restricted space, or similar factors render vegetative and diversion methods physically impractical.

Rip-rap is proposed on the river bank at the outlet of the proposed pipe. No other permanent rip-rap is proposed along the river bank. The roadway slope below the bridge abutments is located beyond the top of bank. This non-jurisdictional slope is currently rip-rap and will remain rip-rap following construction.

(b) Applications for rip-rap shall include:

- (1) Designation of a minimum and maximum stone size;**
- (2) Gradation;**
- (3) Minimum rip-rap thickness;**
- (4) Type of bedding for stone;**

The stone apron will consist of Class C stone on geotextile fabric. The NHDOT specifies Class C stone as follows:

Class C stone shall consist of clean, durable fragments of ledge rock of uniform quality, reasonably free from thin or elongated pieces. The stone shall be made from rock that is free from topsoil and other organic material. The stone shall be graded as follows:

<u>Sieve Size</u>	<u>Percentage by Weight Passing</u>
12 in	100
4 in	50 - 90
1-1/2 in	0 - 30
3/4 in	0 - 10

(5) Cross-section and plan views of the proposed installation;

See attached plans.

(6) Sufficient plans to clearly indicate the relationship of the project to fixed points of reference, abutting properties, and features of the natural shoreline;

The attached plans display the right-of-way boundary and abutting properties, as well as features of the natural shoreline and surrounding area.

(7) A description of anticipated turbulence, flows, restricted space, or similar factors that would render vegetative and diversion methods physically impractical.

Given the high velocity of water that will be discharged from the pipe, stone is required to stabilize the bank at the pipe's outlet. Stone protection at culvert outlets is a common, recommended practice for the prevention of scour. The proximity of the existing right-of-way line, steep roadway slopes, and access trail under the bridge

contribute to the selection of the proposed outlet location as the most practical location.

(c) Applications to use rip-rap adjacent to great ponds or water bodies where the state holds fee simple ownership shall include a stamped surveyed plan showing the location of the normal high water shoreline and the footprint of the proposed project.

The Connecticut River is listed on the Official List of Public Waters. The project area was surveyed by NH Department of Transportation surveyors.

(d) Rip-rap shall be located shoreward of the normal high water shoreline, where practical, and shall not extend more than 2 feet lakeward of that line at any point.

The proposed rip-rap is located shoreward of the ordinary high water line.

(e) Stamped engineering plans shall be provided as part of any application for rip-rap in excess of 100 linear feet along the bank of a stream or river.

The total area of proposed rip-rap is 14 linear feet along the bank.

Wetland Impact & Erosion Control Plans

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

WETLAND PLANS

FEDERAL AID PROJECT

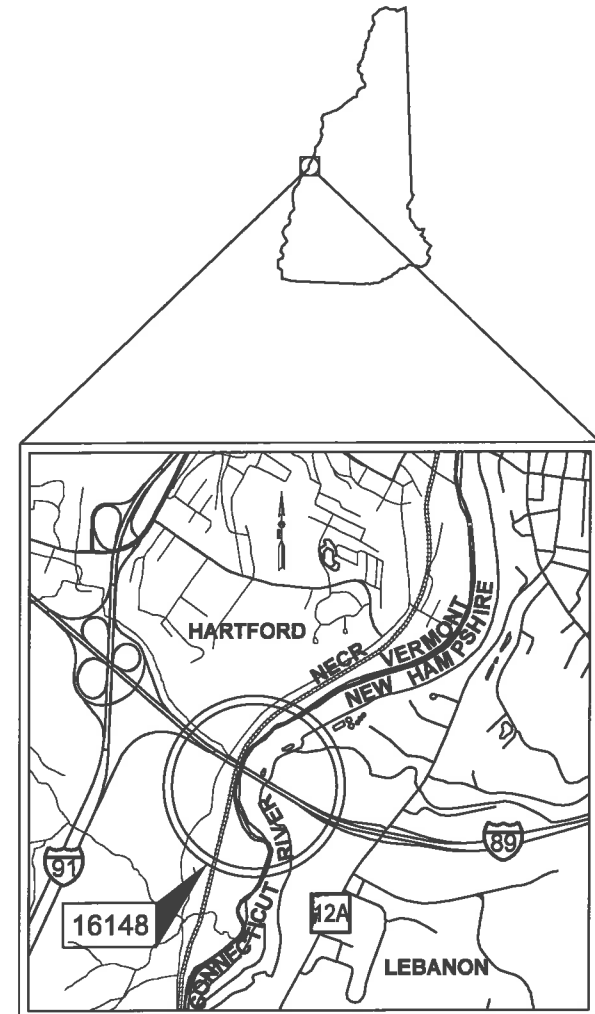
OF PROPOSED BRIDGE REHABILITATION

BRIDGE NO. 044/103 AND BRIDGE NO. 044/104
ON INTERSTATE 89

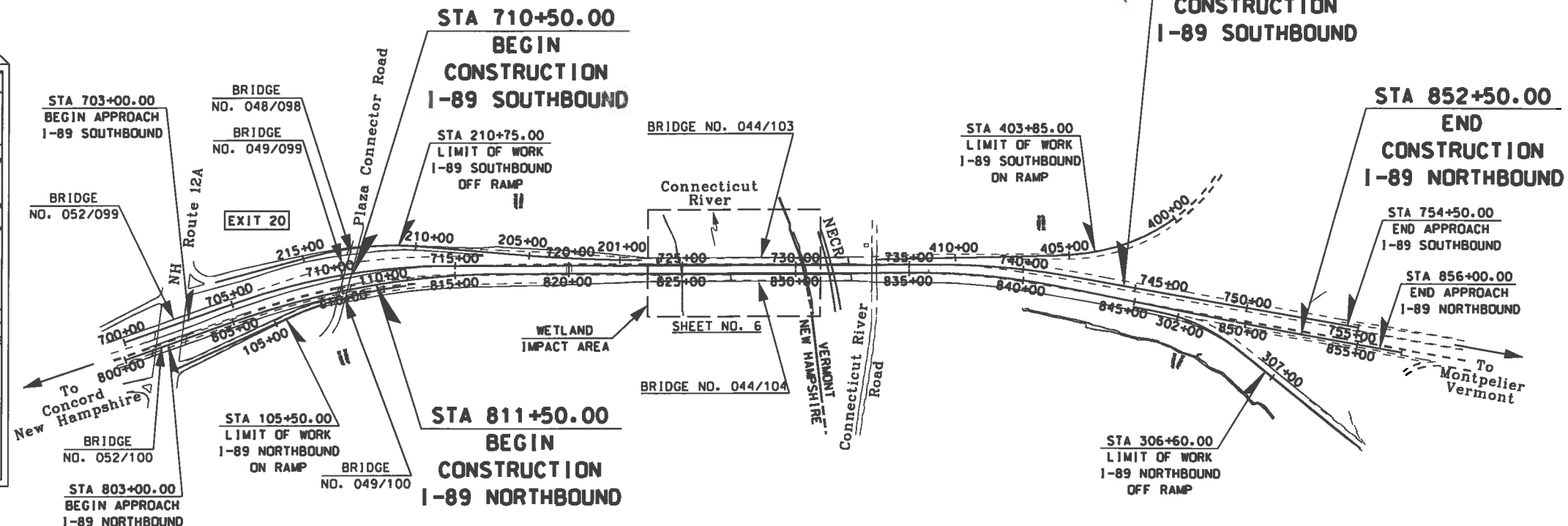
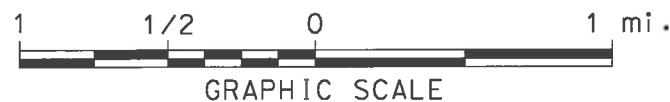
A001(154)

NH PROJECT NO.16148

DESIGN DATA			
INTERSTATE 89			
AVERAGE DAILY TRAFFIC	2019	39,900 (NB & SB)	
AVERAGE DAILY TRAFFIC	2039	43,600 (NB & SB)	
PERCENT OF TRUCKS		10.2%	
DESIGN SPEED		70 MPH - NH (NB)	
		65 MPH - NH (SB)	
		70 MPH - VT (NB & SB)	
LENGTH OF PROJECT		0.78 MILES (NB)	
		0.64 MILES (SB)	



LOCATION MAP



CITY OF LEBANON, NEW HAMPSHIRE
COUNTY OF GRAFTON
AND
TOWN OF HARTFORD, VERMONT
COUNTY OF WINDSOR

SCALE = 1" = 300'

AUGUST 2018

NHDOT THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION			
RECOMMENDED FOR APPROVAL:			
DIRECTOR OF PROJECT DEVELOPMENT		DATE	
APPROVED:			
ASSISTANT COMMISSIONER AND CHIEF ENGINEER		DATE	
FEDERAL PROJECT NO.	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
A001(154)	16148	1	11

FOR CONSTRUCTION AND ALIGNMENT DETAILS - SEE THE CONSTRUCTION PLANS

WETLAND PLANS PREPARED BY



McFARLAND JOHNSON
CONCORD, N.H.

DELINEATION: September 2014



DRAWN BY: MAL
CHECKED BY: BRC
DATE: 04/2016
DATE: 08/2018

GENERAL

SHORELAND - WETLAND

EDGE OF PAVEMENT
TRAVELED WAY

PROPOSED ROADWAY

existing roadway

(pavement removed outside slope lines)

DRIVEWAYS

(label surface type)

BUILDINGS

(label house or type of building)

(building to be removed)

FOUNDATION

(label type)

LEACH FIELD

leach field

BRIDGE CROSSINGS

STREAM

OVERPASS

STEPS AND WALK

(label type)

INTERMITTENT WATER COURSE

SHORE LINE

river/stream

pond (label name of water body)

POTENTIAL WET AREA SYMBOL

BRUSH OR WOODS LINE

TREES (PLANS)

(deciduous)(coniferous)(stump)

(show station, circumference in feet & type)

TREE OR STUMP (CROSS-SECTIONS)

HEDGE

(label type)

MONITORING WELL

WELL

FLAG POLE

ORIGINAL GROUND (TYPICALS)

ROCK OUTCROP

ROCK LINE (TYPICALS & SECTIONS ONLY)

GUARDRAIL (label type)

JERSEY BARRIER

CURB (LABEL TYPE)

STONE WALL

RETAINING WALL (LABEL TYPE)

FENCE (LABEL TYPE)

SIGNS

(single post)

(double post)

GAS PUMP

FUEL TANK (ABOVE GROUND)

STORAGE TANK FILLER CAP

SEPTIC TANK

GRAVE

MAILBOX

VENT PIPE

SATELLITE DISH ANTENNA

PHONE

GROUND LIGHT/LAMP POST

BORING LOCATION

TEST PIT

INTERSTATE NUMBERED HIGHWAY

UNITED STATES NUMBERED HIGHWAY

STATE NUMBERED HIGHWAY

WETLAND DESIGNATION AND TYPE

DELINEATED WETLAND

ORDINARY HIGH WATER

TOP OF BANK

TOP OF BANK & ORDINARY HIGH WATER

NORMAL HIGH WATER

WIDTH AT BANK FULL

PRIME WETLAND

PRIME WETLAND 100' BUFFER

NON-JURISDICTIONAL DRAINAGE AREA

COWARDIN DISTINCTION LINE

TIDAL BUFFER ZONE

DEVELOPED TIDAL BUFFER ZONE

HIGHEST OBSERVABLE TIDE LINE

MEAN HIGH WATER

MEAN LOW WATER

VERNAL POOL

SPECIAL AQUATIC SITE

REFERENCE LINE

WATER FRONT BUFFER

NATURAL WOODLAND BUFFER

PROTECTED SHORELAND

INVASIVE SPECIES LABEL

INVASIVE SPECIES

FLOODPLAIN / FLOODWAY

500 YEAR FLOODPLAIN BOUNDARY

100 YEAR FLOODPLAIN BOUNDARY

FLOODWAY

ENGINEERING

CONSTRUCTION BASELINE

PC, PT, POT (ON CONST BASELINE)

PI (IN CONSTRUCTION BASELINES)

INTERSECTION OR EQUATION OF TWO LINES

ORIGINAL GROUND LINE (PROFILES AND CROSS-SECTIONS)

PROFILE GRADE LINE (PROFILES AND CROSS-SECTIONS)

CLEARING LINE

SLOPE LINE

SLOPE LINE (FILL)

SLOPE LINE (CUT)

PROFILES AND CROSS SECTIONS:

ORIGINAL GROUND ELEVATION (LEFT)

FINISHED GRADE ELEVATION (RIGHT)

DRAINAGE

MANHOLE

CATCH BASIN

DROP INLET

DRAINAGE PIPE (existing)

DRAINAGE PIPE (PROPOSED)

UNDERDRAIN (existing) W/ FLUSHING BASIN

UNDERDRAIN (PROPOSED) W/ FLUSHING BASIN

HEADER (existing & PROPOSED)

END SECTION (existing & PROPOSED)

OPEN DITCH (PROPOSED)

EROSION CONTROL/ STONE SLOPE PROTECTION

show direction of flow












(label size & type)

(with stone outlet protection)

METAL or PLASTIC

RCP

BOUNDARIES / RIGHT-OF-WAY

	(label type)
RIGHT-OF-WAY LINE	_____
RR RIGHT-OF-WAY LINE	_____
PROPERTY LINE	_____ R _____ R _____
PROPERTY LINE (COMMON OWNER)	_____ Z _____ Z _____
TOWN LINE	_____ BOW _____ CONCORD
COUNTY LINE	_____ COOS _____ GRAFTON
STATE LINE	_____ MAINE _____ NEW HAMPSHIRE
NATIONAL FOREST	_____ . _____ . _____
CONSERVATION LAND	_____ -LC- _____ -LC- _____
BENCH MARK / SURVEY DISK	
BOUND	 bnd  (PROPOSED)
STATE LINE/ TOWN LINE MONUMENT	 S/L  T/L
NHDOT PROJECT MARKER	
IRON PIPE OR PIN	 ip
DRILL HOLE IN ROCK	 dh
TAX MAP AND LOT NUMBER	 1642/341 6.80 Ac.±
PROPERTY PARCEL NUMBER	 12
HISTORIC PROPERTY	

UTILITIES

TELEPHONE POLE

POWER POLE

JOINT OCCUPANCY

MISCELLANEOUS/UNKNOWN POLE

GUY POLE OR PUSH BRACE

LIGHT POLE

LIGHT ON POWER POLE

LIGHT ON JOINT POLE

POLE STATUS:
REMOVE, LEAVE, PROPOSED, OR TEMPORARY
AS APPLICABLE e.g.:

RAILROAD

RAILROAD SIGN

RAILROAD SIGNAL

UTILITY JUNCTION BOX

UNDERGROUND UTILITIES

WATER	(on existing lines label size, type and note if abandoned)
-------	--







SEWER
TELEPHONE
ELECTRIC
GAS
LIGHTING
INTELLIGENCE

FIBER OPTIC

WATER SHUT OFF
GAS SHUT OFF
HYDRANT
MANHOLES

MANHOLES

SEWER
TELEPHONE
ELECTRICAL
GAS
UNKNOWN

<u>existing</u>	<u>PROPOSED</u>
	   (plot point at face not center of symbol)
	
	

OW OW OW OW









(label type)

U	U	PW	PW
S	S	PS	PS
T	T	PT	PT
E	E	PE	PE
G	G	PG	PG
L	L	PL	PL
ITS	ITS	PITS	PITS
FQ	FQ	PFO	PFO

TRAFFIC SIGNALS / ITS

	<u>existing</u>	<u>PROPOSED</u>
MAST ARM (existing)		
OPTICOM RECEIVER		
OPTICOM STROBE		
TRAFFIC SIGNAL		
PEDESTAL WITH PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON UNIT		
SIGNAL CONDUIT		
CONTROLLER CABINET		
METER PEDESTAL		
PULL BOX		
LOOP DETECTOR (QUADRUPOLE)		
LOOP DETECTOR (RECTANGULAR)		
CAMERA POLE (CCTV)		
FIBER OPTIC DELINEATOR		
FIBER OPTIC SPLICE VAULT		
ITS EQUIPMENT CABINET		
VARIABLE SPEED LIMIT SIGN		
DYNAMIC MESSAGE SIGN		
ROAD AND WEATHER INFO SYSTEM		

CONSTRUCTION NOTES

CURB MARK NUMBER - BITUMINOUS	B-1
CURB MARK NUMBER - GRANITE	G-1
CLEARING AND GRUBBING AREA	 A
DRAINAGE NOTE	 1
EROSION CONTROL NOTE	 A
FENCING NOTE	 A
GUARDRAIL NOTE	 1
ITS NOTE	 1
LIGHTING NOTE	 A
TRAFFIC SIGNAL NOTE	 1

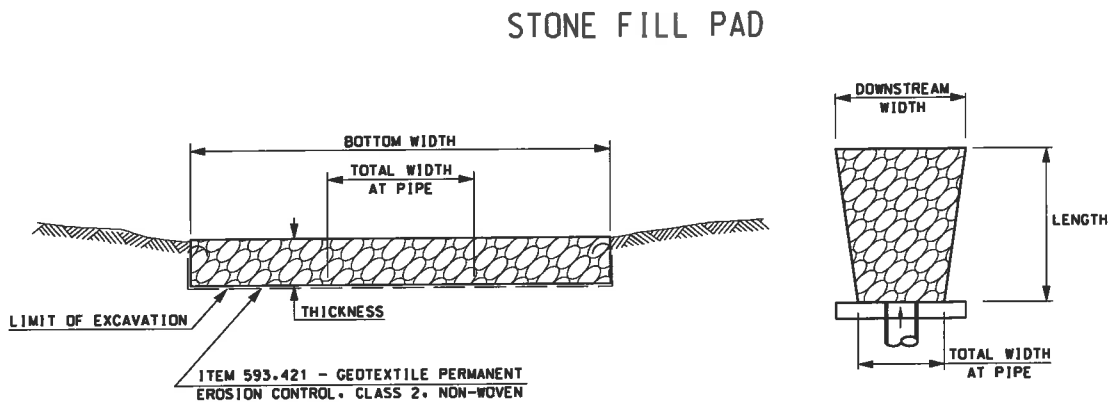
SHEET 2 OF 2

STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

STANDARD SYMBOLS

REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
9-1-2016	10430syml_2	16148	3	11

SR PROCESSED	NHDT	REVISIONS AFTER PROPOSAL			
		DATE	BY	STATION	DESCRIPTION
NEW DESIGN	MJ	04-2015			
SHEET CHECKED	BRC	04-2016			
AS BUILT DETAILS		02-2018			
		DATE			



LOCATION	LENGTH	TOTAL WIDTH AT PIPE	DOWNSTREAM WIDTH	STONE CLASS	THICKNESS
STA 824+87.0, RT 161.7'	12'	6'	14.8'	C	1.0

WETLAND IMPACT SUMMARY - NEW HAMPSHIRE												
WETLAND NUMBER	WETLAND CLASS- IFICATION	LOCATION	AREA IMPACTS						LINEAR STREAM IMPACTS FOR MITIGATION			COMMENTS
			PERMANENT				TEMPORARY		PERMANENT			
			N.H.W.B. (NON-WETLAND)		N.H.W.B. & A.C.O.E. (WETLAND)				BANK LEFT	BANK RIGHT	CHANNEL	
			SF	LF	SF	LF			SF	LF	LF	
2	BANK	A	579	45					45			OUTLET OF VEGETATED TREATMENT SWALE
2	BANK	B					145	41				TEMPORARY BULKHEAD (BANK IMPACT)
3	R2UBH	C					1309	41			41	TEMPORARY BULKHEAD (CHANNEL IMPACT)
3	R2UBH	D			733	43					43	NEW PIER FOOTING
3	R2UBH	E			10145	143						A - JACKS
3	R2UBH	F			705	39					39	NEW PIER FOOTING
3	R2UBH	G			10750	143						A - JACKS
3	R2UBH	H			939	39					39	NEW PIER FOOTING
3	R2UBH	I			741	37					37	NEW PIER FOOTING
3	R2UBH	J					1598	42			42	TEMPORARY BULKHEAD (CHANNEL IMPACT)
2	BANK	K					532	50				TEMPORARY BULKHEAD (BANK IMPACT)
3	R2UBH	L					1217	50			50	TEMPORARY BULKHEAD (CHANNEL IMPACT)
2	BANK	M					471	40				TEMPORARY BULKHEAD (BANK IMPACT)
2	BANK	N	44	14					14			PIPE OUTLET / STONE APRON
3	R2UBH	O					1422	40			40	TEMPORARY BULKHEAD (CHANNEL IMPACT)
3	R2UBH	P					87289	221				TEMPORARY IMPACTS FOR CONSTRUCTION ACCESS*
3	R2UBH	Q					1164	40			40	TEMPORARY BULKHEAD (CHANNEL IMPACT)
TOTAL			623	59	24,013	444	95,147	565	59		371	

NEW HAMPSHIRE IMPACTS
 PERMANENT IMPACTS: 24,636 SF
 TEMPORARY IMPACTS: 95,147 SF
 TOTAL IMPACTS: 119,783 SF

VERMONT IMPACTS
 PERMANENT IMPACTS: 0 SF
 TEMPORARY CHANNEL: 385 SF

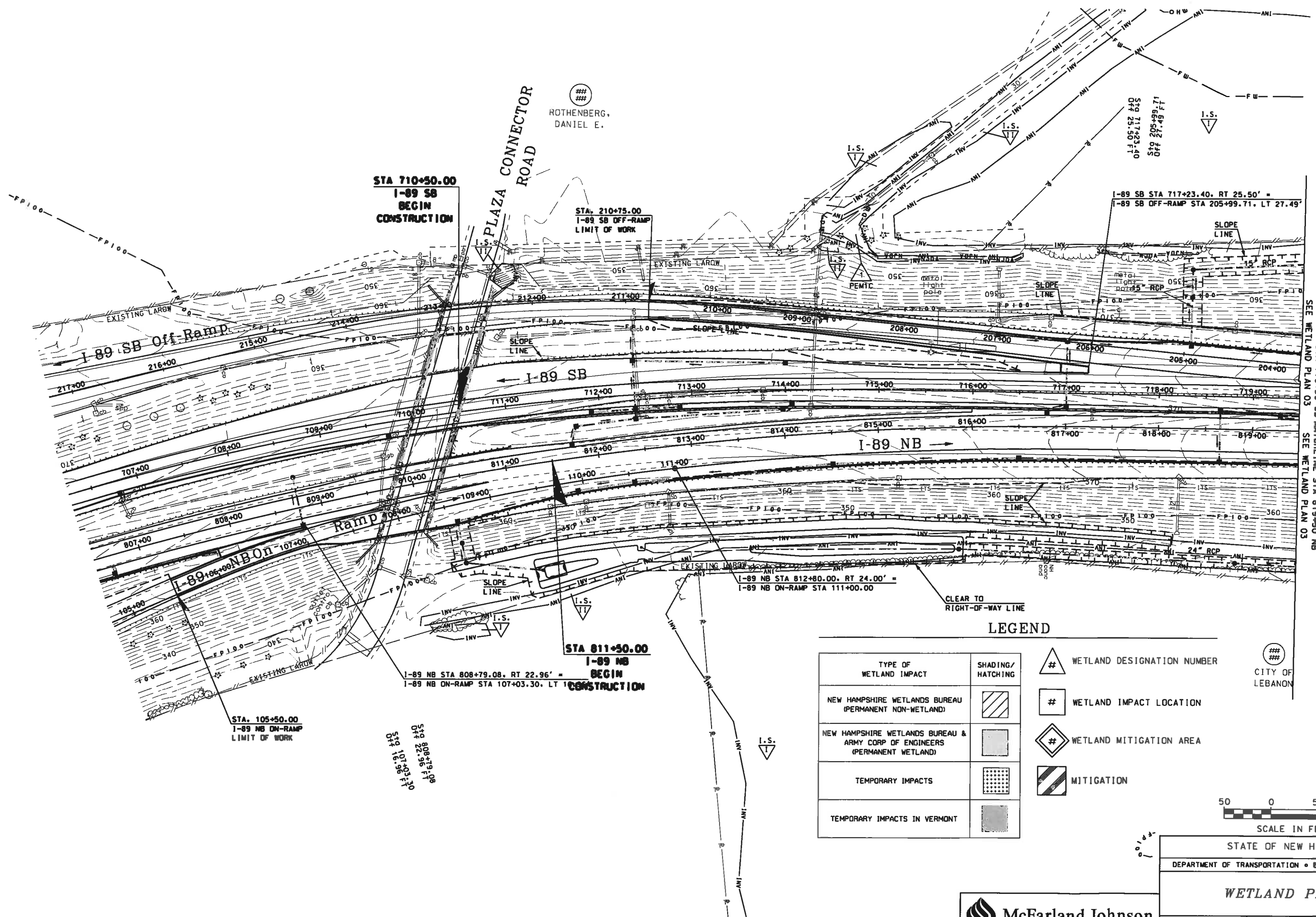
Cowardin Classification
 R2UBH (Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded)

*ACTUAL IMPACTS WILL BE LIMITED TO TRESTLE PILES (APPROX. 600 SF)

STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
WETLAND IMPACT SUMMARY SHEET			
DCW	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148wetsum	16148	4	11



REVISIONS AFTER PROPOSAL		STATION	DATE	NUMBER
SDR PROCESSED	MMDT		DATE 04-2015	
NEW DESIGN	MAJ		DATE 04-2016	
SHEET CHECKED	BRC		DATE 02-2018	
AS BUILT DETAILS			DATE	



LEGEND

TYPE OF WETLAND IMPACT	SHADING/HATCHING	# WETLAND DESIGNATION NUMBER
NEW HAMPSHIRE WETLANDS BUREAU (PERMANENT NON-WETLAND)	[Hatched Box]	# WETLAND IMPACT LOCATION
NEW HAMPSHIRE WETLANDS BUREAU & ARMY CORP OF ENGINEERS (PERMANENT WETLAND)	[Solid Box]	# WETLAND MITIGATION AREA
TEMPORARY IMPACTS	[Dotted Box]	[Hatched Box] MITIGATION
TEMPORARY IMPACTS IN VERMONT	[Solid Box]	

50 0 50 100
SCALE IN FEET

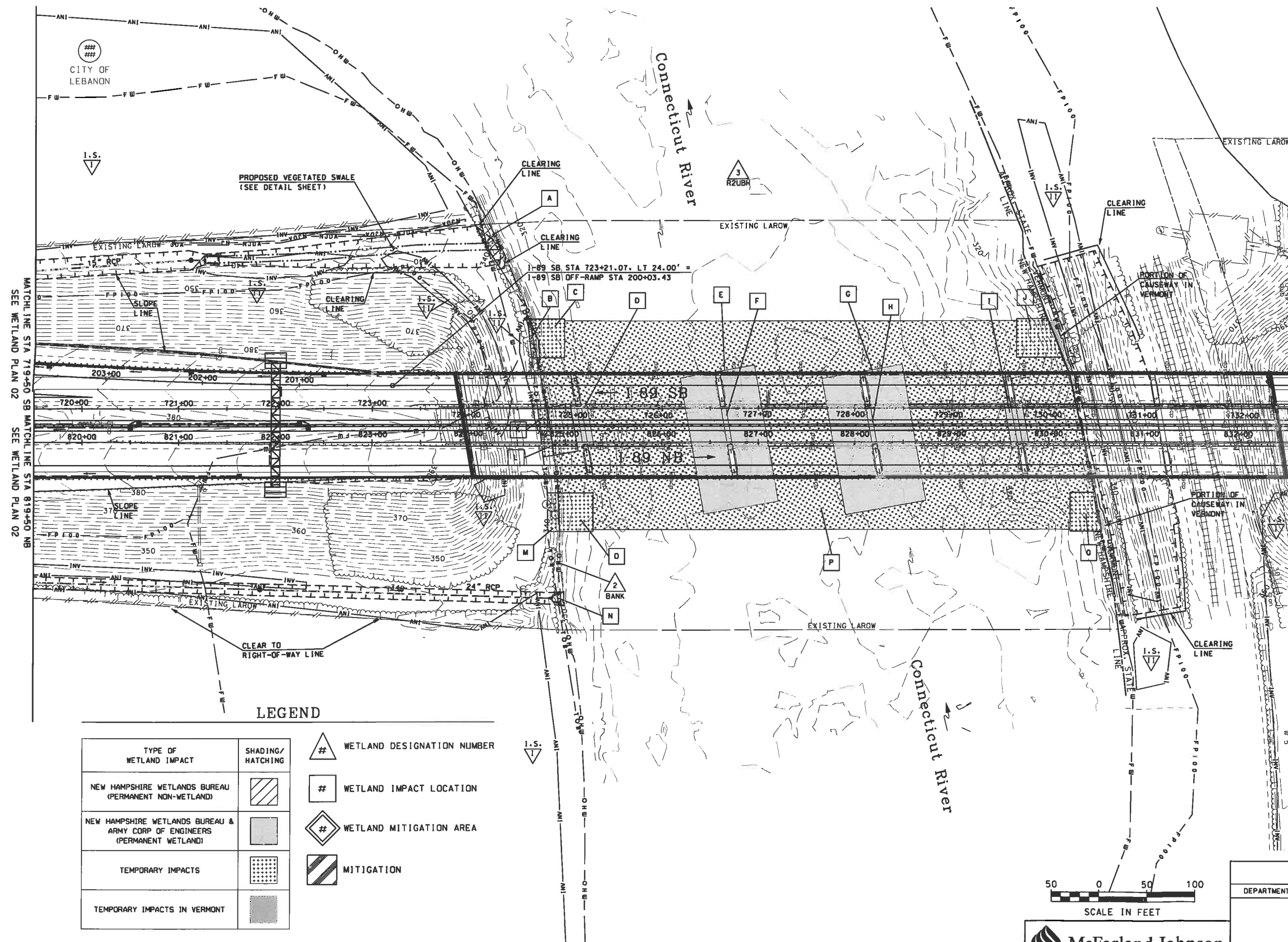
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

WETLAND PLAN 01

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148genplans	16148	5	11



SDR PROCESSED		NHDOT	DATE	04-2015	REVISIONS AFTER PROPOSAL			
NEW DESIGN		I/J	DATE	04-2016	NUMBER	DATE	STATION	DESCRIPTION
SHEET CHECKED		BRC	DATE	02-2018				
AS BUILT DETAILS								



STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
WETLAND PLAN 02			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148genplans	16148	6	11

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
- 1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
- 1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
- 1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND PERMIT, THE US ARMY CORPS OF ENGINEERS PERMIT, WATER QUALITY CERTIFICATION AND THE SPECIAL ATTENTION ITEMS INCLUDED IN THE CONTRACT DOCUMENTS.
- 1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
- 1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17, AND ALL, PUBLISHED NHDES ALTERATION OF TERRAIN ENV-WO 1500 REQUIREMENTS ([HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM](http://des.nh.gov/organization/commissioner/legal/rules/index.htm))
- 1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH SECTION 107.1 OF THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.
2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
- 2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
- 2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
- 2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGES CONSTRUCTION.
- 2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
- (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
- (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
- (C) A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED;
- (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED
- 2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
- 2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE CONTRACT ADMINISTRATOR.
- 2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
- 2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30th AND MAY 1st OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
- (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15th, OR WHICH ARE DISTURBED AFTER OCTOBER 15th, SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
- (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15th, OR WHICH ARE DISTURBED AFTER OCTOBER 15th, SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
- (C) AFTER NOVEMBER 30th INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
- (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER STABILIZATION PLAN HAS BEEN APPROVED BY NHDOT.
- (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE DEPARTMENT, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV-WO 1505.05) NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30th.
- GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS
3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
- 3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
- 3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
- 3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
- 3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
- 3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH SECTION 2.1.2.1. OF THE 2012 NPDES CONSTRUCTION GENERAL PERMIT.
4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
- 4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
- 4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
- 4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1st THROUGH NOVEMBER 30th, OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE DEPARTMENT THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.
5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
- 5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
- 5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
- 5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
- 5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
- 5.5. DIVERT OFF-SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.
6. PROTECT SLOPES:
- 6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
- 6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
- 6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
- 6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE-RAKED, OR HAND-WORKED TO PRODUCE A RUFFLED SURFACE.
7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
- 7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT-OF-WAY.
- 7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.
8. PROTECT STORM DRAIN INLETS:
- 8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
- 8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
- 8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
- 8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN-GRADIENT SENSITIVE RECEPTORS.
9. SOIL STABILIZATION:
- 9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
- 9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS (SECTION 2.2) OF THE 2012 CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
- 9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR, IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
- 9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.
10. RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES:
- 10.1. TEMPORARY SEDIMENT BASINS (CGP-SECTION 2.1.3.2) OR SEDIMENT TRAPS (ENV-WO 1506.10) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2-YEAR 24-HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER. TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5-ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10-YEAR 24 HOUR STORM EVENT. ON-SITE RETENTION OF THE 10-YEAR 24-HOUR EVENT IS NOT REQUIRED.
- 10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
- 10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
- 11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE NHDES.
- 11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
- 11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24-HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE GUIDANCE MEMO FROM THE NHDES CONTAINED WITHIN THE CONTRACT PROPOSAL AND THE EPA CONSTRUCTION GENERAL PERMIT.
- 11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
- 11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
- 11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
- 11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
- 11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE DEPARTMENT.
- 11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. STRATEGIES SPECIFIC TO OPEN AREAS LESS THAN 5 ACRES:
- 12.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17 AND ENV-WO 1500: ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.
- 12.2. SLOPES STEEPER THAN 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING.
- 12.3. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT ALONE.
- 12.4. AREAS WHERE HAUL ROADS ARE CONSTRUCTED AND STORMWATER CANNOT BE TREATED THE DEPARTMENT WILL CONSIDER INFILTRATION.
- 12.5. FOR HAUL ROADS ADJACENT TO SENSITIVE ENVIRONMENTAL AREAS OR STEEPER THAN 5%, THE DEPARTMENT WILL CONSIDER USING EROSION STONE, CRUSHED GRAVEL, OR CRUSHED STONE BASE TO HELP MINIMIZE EROSION ISSUES.
- 12.6. ALL AREAS THAT CAN BE STABILIZED SHALL BE STABILIZED PRIOR TO OPENING UP NEW TERRITORY.
- 12.7. DETENTION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE A 2 YEAR STORM EVENT.
13. STRATEGIES SPECIFIC TO OPEN AREAS BETWEEN 5 AND 10 ACRES:
- 13.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17 AND ENV-WO 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES WILL BE UTILIZED.
- 13.2. DETENTION BASINS WILL BE CONSTRUCTED TO ACCOMMODATE THE 2-YEAR 24-HOUR STORM EVENT AND CONTROL A 10-YEAR 24-HOUR STORM EVENT.
- 13.3. SLOPES STEEPER THAN A 3:1 WILL RECEIVE TURF ESTABLISHMENT WITH MATTING OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS. OTHER ALTERNATIVE MEASURES, SUCH AS BONDED FIBER MATRIXES (BFMS) OR FLEXIBLE GROWTH MEDIUMS (FGMS) MAY BE UTILIZED, IF MEETING THE NHDES APPROVALS AND REGULATIONS.
- 13.4. SLOPES 3:1 OR FLATTER WILL RECEIVE TURF ESTABLISHMENT OR OTHER TEMPORARY SOIL STABILIZATION MEASURES DETAILED IN TABLE 1. THE CONTRACTOR MAY ALSO CONSIDER A SOIL BINDER IN ACCORDANCE WITH THE NHDES APPROVALS OR REGULATIONS.
14. STRATEGIES SPECIFIC TO OPEN AREAS OVER 10 ACRES:
- 14.1. THE CONTRACTOR SHALL COMPLY WITH RSA 485-A:17 AND ENV-WO 1500 ALTERATION OF TERRAIN AND SHALL USE CONVENTIONAL BMP STRATEGIES AND ALL TREATMENT OPTIONS USED FOR UNDER 5 ACRES AND BETWEEN 5 AND 10 ACRES WILL BE UTILIZED.
- 14.2. THE DEPARTMENT ANTICIPATES THAT SOIL BINDERS WILL BE NEEDED ON ALL SLOPES STEEPER THAN 3:1, IN ORDER TO MINIMIZE EROSION AND REDUCE THE AMOUNT OF SEDIMENT IN THE STORMWATER TREATMENT BASINS.
- 14.3. THE CONTRACTOR WILL BE REQUIRED TO HAVE AN APPROVED DESIGN IN ACCORDANCE WITH ENV-WO 1506.12 FOR AN ACTIVE FLOCCULANT TREATMENT SYSTEM TO TREAT AND RELEASE WATER CAPTURED IN STORM WATER BASINS. THE CONTRACTOR SHALL ALSO RETAIN THE SERVICES OF AN ENVIRONMENTAL CONSULTANT WHO HAS DEMONSTRATED EXPERIENCE IN THE DESIGN OF FLOCCULANT TREATMENT SYSTEMS. THE CONSULTANT WILL ALSO BE RESPONSIBLE FOR THE IMPLEMENTATION AND MONITORING OF THE SYSTEM.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

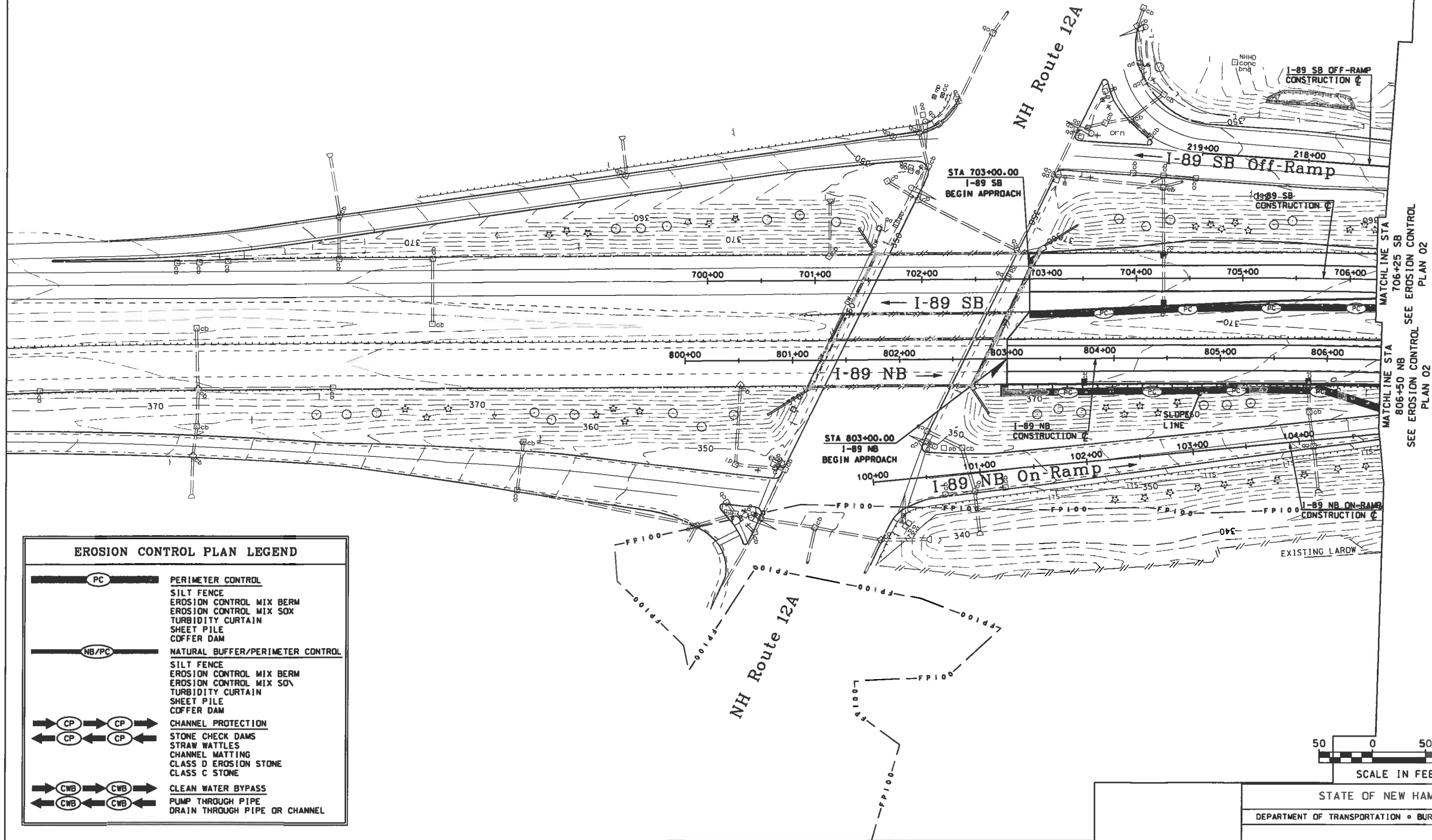
APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES ²				ROLLED EROSION CONTROL BLANKETS ³			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNCSB	DNCSB
SLOPES ¹												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNCSB	2 NET STRAW-COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCSB	2 NET COCONUT BLANKET

- NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

STATE OF NEW HAMPSHIRE				
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN				
EROSION CONTROL STRATEGIES				
REVISION DATE	DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
12-21-2015	16148erostr.dgn	16148	7	11

SJR PROCESSED	NHDOT	DATE	04-2015	REVISIONS AFTER PROPOSAL	
	NEW DESIGN	DATE	04-2016	STATION	DESCRIPTION
	SHEET CHECKED	DATE	02-2018		
	AS BUILT DETAILS	DATE			

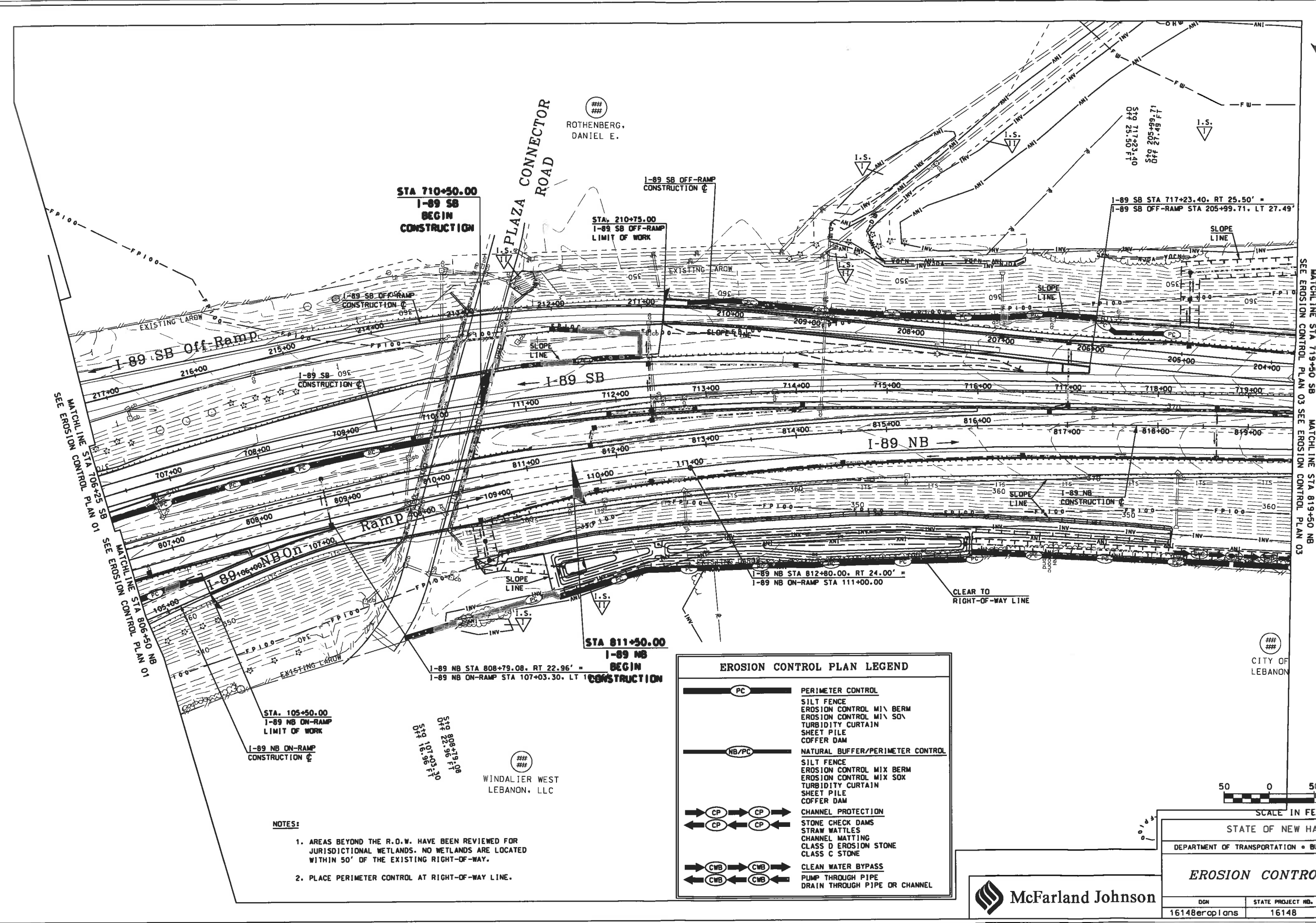


EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL
	NATURAL BUFFER/PERIMETER CONTROL
	CHANNEL PROTECTION
	CLEAN WATER BYPASS

STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
EROSION CONTROL PLAN 01			
DON	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148eroplans	16148	8	11



REVISIONS AFTER PROPOSAL		STATION	DATE	NUMBER
SDR PROCESSED	MMDOT		DATE 04-2015	
NEW DESIGN	MMJ		DATE 04-2016	
SHEET CHECKED	BRC		DATE 02-2018	
AS BUILT DETAILS			DATE	



- NOTES:**
1. AREAS BEYOND THE R.O.W. HAVE BEEN REVIEWED FOR JURISDICTIONAL WETLANDS. NO WETLANDS ARE LOCATED WITHIN 50' OF THE EXISTING RIGHT-OF-WAY.
 2. PLACE PERIMETER CONTROL AT RIGHT-OF-WAY LINE.

EROSION CONTROL PLAN LEGEND

	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	CHANNEL PROTECTION STONE CHECK DAMS STRAW WATTLES CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE
	CLEAN WATER BYPASS PUMP THROUGH PIPE DRAIN THROUGH PIPE OR CHANNEL

50 0 50 100
SCALE IN FEET

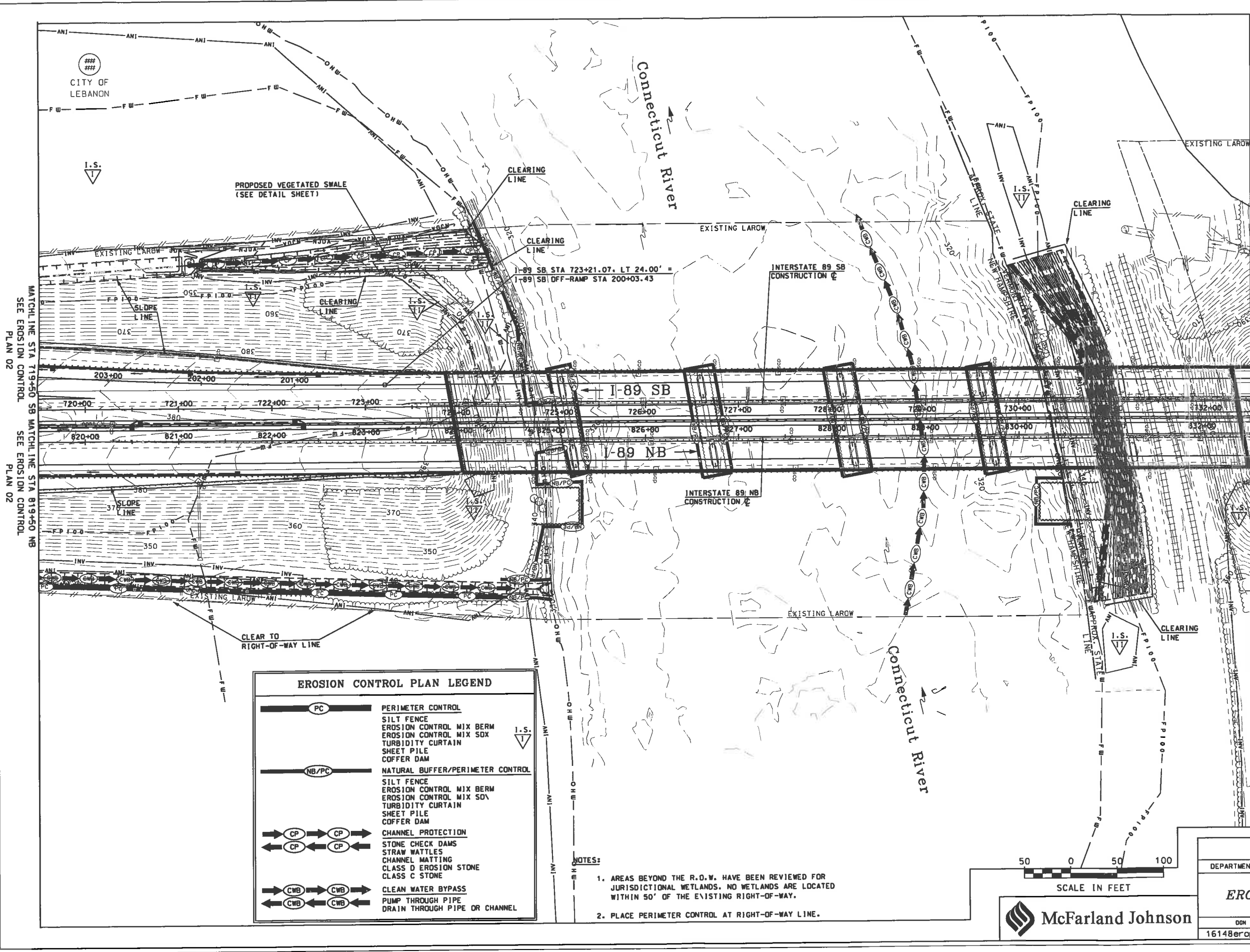
STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN

EROSION CONTROL PLAN 02

DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148eroplans	16148	9	11



REVISIONS AFTER PROPOSAL		STATION	DATE	NUMBER
SDR PROCESSED	NHDT		DATE 04-2015	
NEW DESIGN	WJ		DATE 04-2016	
SHEET CHECKED	BRC		DATE 02-2018	
AS BUILT DETAILS			DATE	



EROSION CONTROL PLAN LEGEND	
	PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	NATURAL BUFFER/PERIMETER CONTROL SILT FENCE EROSION CONTROL MIX BERM EROSION CONTROL MIX SOX TURBIDITY CURTAIN SHEET PILE COFFER DAM
	CHANNEL PROTECTION STONE CHECK DAMS STRAW WATTLES CHANNEL MATTING CLASS D EROSION STONE CLASS C STONE
	CLEAN WATER BYPASS PUMP THROUGH PIPE DRAIN THROUGH PIPE OR CHANNEL

- NOTES:**
- AREAS BEYOND THE R.O.W. HAVE BEEN REVIEWED FOR JURISDICTIONAL WETLANDS. NO WETLANDS ARE LOCATED WITHIN 50' OF THE EXISTING RIGHT-OF-WAY.
 - PLACE PERIMETER CONTROL AT RIGHT-OF-WAY LINE.



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NOTE:
VERMONT SIDE WILL REQUIRE VERMONT STORMWATER PERMITS AND EROSION CONTROL PLANS, PREPARED TO VERMONT STANDARDS.

STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
EROSION CONTROL PLAN 03			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148eroplans	16148	10	11

SECTION E-E
SCALE: 1/8" = 1'-0"

SECTION F-F
SCALE: 1/8" = 1'-0"

Labels and dimensions include:

- BRG. PIER 5
- BRG. ABUTMENT B
- GIRDER
- APPROACH SLAB
- TOP OF ROADWAY
- APPROXIMATE EXISTING GROUND
- 1'-0" (TYP.)
- GRANULAR BACKFILL (BRIDGE) (F) (ITEM 209.201)
- SUITABLE FILL (SUBSIDIARY) (TYP)
- EL 392.1
- 1'-0" STRUCTURAL FILL (ITEM 508)
- HP-PILE (TYP)
- 2'-0" STONE FILL, CLASS C (ITEM 585.3)
- GEOTEXTILE: PERM CONTROL CL.1, NON-WOVEN (ITEM 593.411)
- TIE STONE FILL IN TO EXISTING SLOPE
- LIMITS OF COMMON BRIDGE EXCAVATION (F) (ITEM 504.1)
- 16'-0" ±
- LIMITS OF COMMON BRIDGE EXCAVATION (F) (ITEM 203.1)
- RAILROAD TRACK
- STONE FILL, CLASS B (BRIDGE) (ITEM 585.21)
- 15'-0" ±
- TOP OF EXISTING BANK
- BERM VARIES
- 8'-0" THICK RIP-RAP, CLASS XX (ITEM 583.X)
- APPROXIMATE EXISTING GROUND
- LIMITS OF UNCLASSIFIED CHANNEL EXCAVATION (ITEM 207.3)
- EL 355.6
- GRANULAR BACKFILL (GRAVEL) (TYP) (ITEM 209.4)
- COFFERDAMS (ITEM 503.202)
- GEOTEXTILE: PERM CONTROL CL.1, NON-WOVEN (ITEM 593.411)
- EL 324.00
- EL 332.0'
- OHW EL 331.0' ±
- 0+100 EL = 350.8
- APPROX. STATE LINE
- NEW HAMPSHIRE VERMONT

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STATE OF NEW HAMPSHIRE			
DEPARTMENT OF TRANSPORTATION • BUREAU OF HIGHWAY DESIGN			
VERMONT BANK SECTION (FLOOD MITIGATION)			
DGN	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16148wetsec†	16148	11	11


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